The
BRICK SALESMAN

by

RALPH P. STODDARD

PUBLISHED BY
THE COMMON BRICK
MANUFACTURERS
ASSOCIATION
OF AMERICA

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BRICK SALESMAN

By
RALPH P. STODDARD

Published by
The Common Brick
Manufacturers' Association
of America

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Cleveland, Ohio

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By Ralph P. Stoddard

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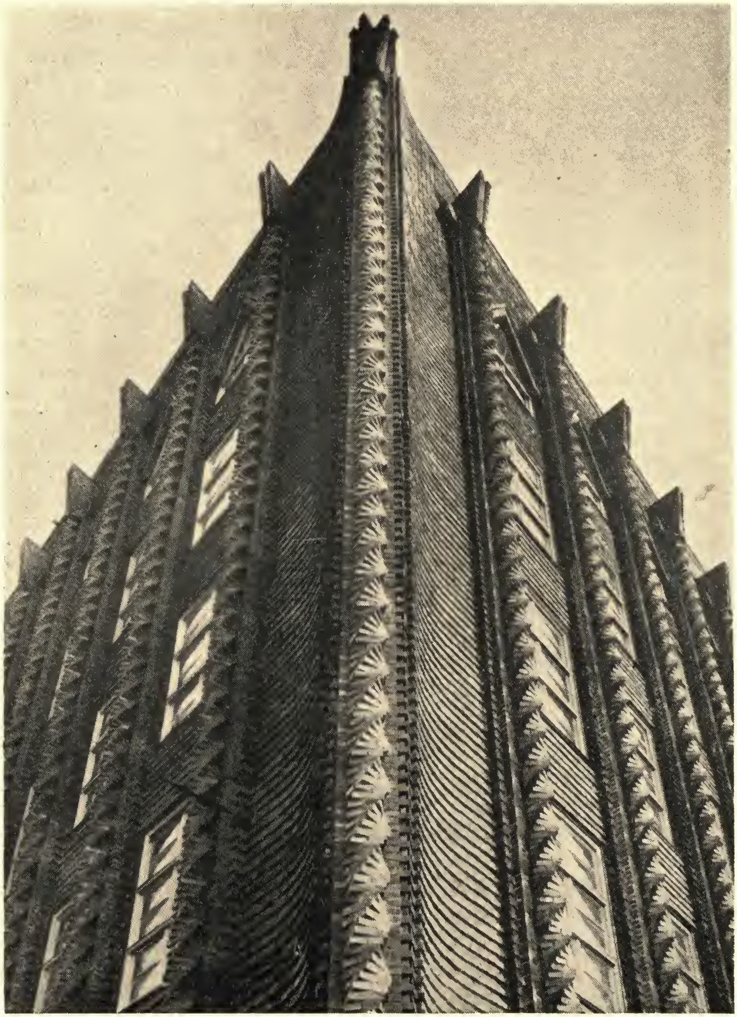


An interesting detail of modern German brickwork, the corner of a factory building in Hamburg.

Why This Book?

TO get a true picture of the potential market for building brick, imagine that the process of manufacturing brick had never been discovered up to this time. All construction in the past has been in stone, steel, wood, concrete, gypsum and lime. Clay products are unknown.

Now comes the startling announcement from Washington that patents upon a new building unit have been granted. This new material is manufactured from the cheapest of all raw materials—mud. It possesses natural beauty, in a variety of colors and shades from white to black, and its beauty is absolutely permanent. Fire cannot destroy it because it is made by fire, neither is it affected by the elements and is proof against exposure for centuries, either above or below ground.

This new unit is scientifically dimensioned so that it may be used to produce any thickness of wall with the units so bonded together that the mass becomes virtually monolithic. Yet it is so flexible that it is adapted to intricate designing and infinite variety of treatment.

This material stimulates the artistry of the architect because it is to him what the modeling clay is to the sculptor, or the pigments to the artist. It satisfies the engineer because it produces self-decorated masonry at any desired strength. It appeals to the builder because with it he may express individuality.

Most amazing of all is the information that this new building unit is to be lowest in cost, because the raw material from which it is made is available everywhere.

Do you know what would happen if such an announcement appeared in today's newspapers?

Why! Thousands of live go-getting salesmen—the kind who are too good to work for a salary and demand commission jobs—would have the wires hot trying to sign up with the inventor. But because a material accurately fitting this description has been made and used for ten thousand years and is almost as common as air, we find much of the selling ability in the field of building materials presenting other and newer materials with the claim that they are "just as good as brick."

The antiquity of brick is an asset. No other building material has such a history. The development of civilization is recorded in brick. If brick has settled into the background of the picture, it needs only to be pulled up to the front and featured to make it the best selling proposition in the construction market.

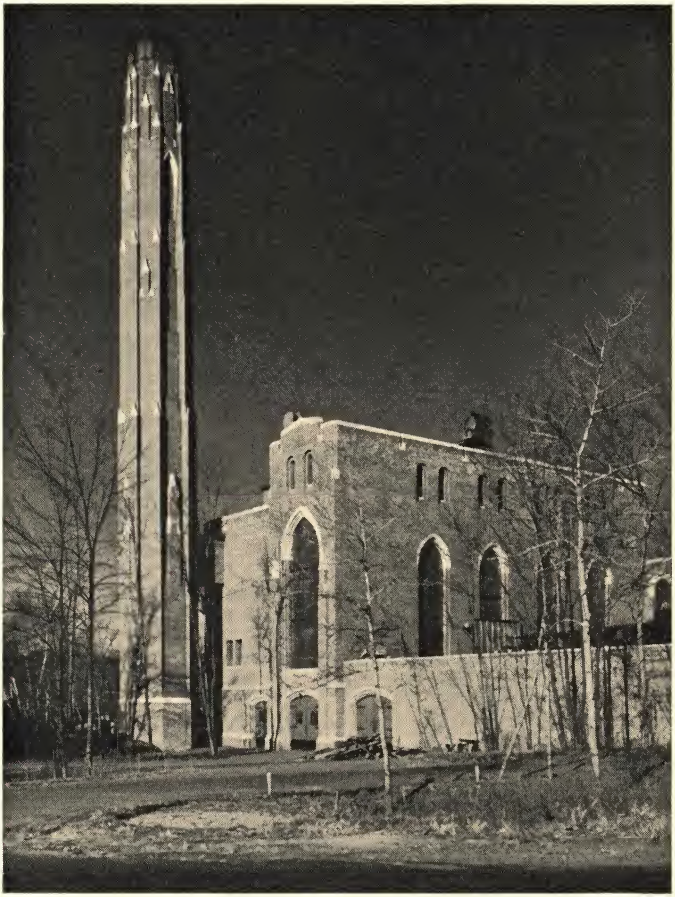
Since the discovery of electricity, men have stretched expensive wires around the world in order to transmit sound. Then came Marconi to tell the world that the air could be used and the wire dispensed with. But the air was here before the wire. Now think of the millions of dollars being spent for apparatus to take advantage of this new use of the air and you will have some conception of the market for brick—if we study it thoroughly and tell all the people of the advantages of brick and how best to use it.

Salesmanship for the first time is coming into the brick business, and remarkable strides have been made. The number of real salesmen in the business—men who sell brick on its merits—should be greatly increased. The toughest days are past. The field should attract men who like to do constructive work.

The selling of brick is constructive. The man who uses brick is benefited and the community is well served by each new brick structure erected, because the fire hazard is lessened and waste through depreciation is checked.

This book is to help the men whose job is to sell building brick by presenting: (1) Non-technical information about brick; (2) Undeniable reasons why there is a place for economical and serviceable use of brick in every piece of construction from the monumental building to the one-car garage.

After intimate contact with the brick business for a number of years I am convinced that real merchandising is one of the crying needs of the industry, and that the field offers unlimited opportunity to salesmen of the highest type.



Common brick power house and stack, St. Paul's School for Boys, Concord, N. H.

The Brick Salesman

BRICK, like an article of gold or silver, a precious stone, an oriental rug, mahogany and oak, leather, a durable and stylish garment, a perfected machine and pure foods, is a quality product.

"The best always is cheapest"—everybody knows that. Most people buy on that principle. When they don't, it is usually because they are uninformed regarding the thing purchased.

Those who sell gold and silver, diamonds, Persian rugs, mahogany, oak, leather, good clothes and good foods have established in the public mind a consciousness of the superior quality of their goods.

When automobiles were new, few people had any sense of value regarding the springs, axles, bearings, piston rings, and other parts which, assembled, made the car. They bought cars upon their appearance or the reputation of the sellers. Specifications meant little to the buyer.

How did the public learn all about the things that go into an automobile? Did they search the public library for information, or study mechanical engineering? They did not.

The car manufacturer and the manufacturer of the parts told the public all about it, so that to-day the motor salesman sells mainly on specification. What the car is made of, plus the reputation of the maker, plus appearance, are the selling factors.

Building Is Complex Job

A completed five-room cottage is as complex a job as an automobile. It is just as important that the buyer know the value of the constituent elements of the cottage as that he know what his automobile is made of—in fact it is more important, because safety, health, comfort and security of investment are at stake.

There are thousands of home owners who can make a radio set that works or who discuss glibly the specifications of their car, who don't know what the walls of their homes are built of.

This is a true story. A friend proudly invited me out to see his new home in a suburb of Chicago. He bought it ready built.

"What's back of the stucco?" I asked him after admiring the architecture, the beautiful wooded lot and the convenient arrangement of the rooms.

"What do you mean?" he asked.

"Why! Is it a masonry wall or just stucco on frame?" I asked.

"I don't know," he replied. "Does that make any difference?"

When builders have for sale real, honest-to-goodness brick houses, with masonry walls throughout, they feature these advantages.

When builders sell other kinds of houses, they play up the finish of the woodwork, the lighting fixtures and the built-in features.

The brick salesman has a job in this connection . He must inform the builder of homes of the advantages of honest masonry construction. The brick salesman is not selling houses or apartments or school buildings. He is selling just one of the component parts of the building.

What Is In the Walls?

The man-about-to-build has definite ideas about the kind of plumbing, the heating, the finishing wood, the roofing material that he wants. He knows what material he wants *exposed* on the exterior of the house, whether shingles, wide siding, stucco, brick or stone. Advertising has taught him all this. But he doesn't know how the walls should be built back of the exterior finish, or of what dimensions the framing timbers should be. The features of the house upon which depend its safety and comfort, its expense in upkeep, its durability and its resale value, he knows least about. If he seeks information from building material people he will get conflicting opinions. Going to the contractors, he will get frame suggestions from the carpenter and masonry suggestions from the mason. Even the architects divide in their preference for types of construction.

What is the poor man to do but wave it all aside and leave structural details to his architect or builder, demanding only that the things which he *sees* in the completed house are exactly what he selects?

It is because the home buyer and home builder have not been educated, through advertising, in the structural features of the house that they accept inferior construction. Often the home builder or buyer pays as much for a house which lacks durability and comfort, which is high in upkeep cost and in depreciation, as would buy him an honest-built masonry house.

It is a good thing for all people selling building materials, as well as for the real estate man, to have the home owner get 100 cents worth of house for his dollar. It is not good business for the building business to have thousands of home owners, as is true today, discouraging their friends in home ownership. Their experience has been unfortunate. It has cost them more to own their home than it did to rent one, because they do not have the right kind of a home. Their home-owning instinct was exploited by someone who had something to sell.

Education Blow to Poor Building

The widespread reaction against the so-called "jerry builder," or the unscrupulous builder known by any name, would have come much sooner had the manufacturers and dealers in the best building materials begun their educational campaign with the public sooner. The proper promotion and a strong selling effort for brick construction will, more than any other effort, put the "jerry builder" out of business. The brick salesman must establish in the mind of the home builder the same consciousness of quality for brick that has been established by the sellers of other quality products.

Go through the advertising pages of any weekly or monthly magazine of high class and see if you can find a single ad that features the cheapness of the product advertised. There may be reference to the economy of quality, but you will find that practically every successfully advertised commodity is sold upon quality and not upon price.

Brick is a quality product. Brick construction is quality construction possessing advantages not equaled by any other construction. No one has a right to expect high quality to compete in first cost with cheapness.

In my judgment, no salesman is prepared to sell brick unless he first firmly believes that brick is the best of all building materials for producing the highest quality of construction and that it can be sold to the public on a quality basis just as any other good building material or building equipment is sold upon quality —just as Steinway pianos, Packard automobiles, tailored clothes, Tiffany products are sold.

The Service Idea

A SALESMAN who does not observe the rule of service does not get very far in his profession. It is expressed in different ways, but perhaps not better than by the Sheldon School of Business. "He profits most who serves best."

There is no place for the "one timer" in the brick business. When a brick man makes a sale, he should make also a permanent friend by rendering to the customer a service that will be permanently satisfactory. If the salesman will always approach his prospect with the idea uppermost in his mind that he is going to do something for the prospect and is properly equipped and prepared to render a service to the prospect, he rarely fails.

Remember, as you approach a person to sell brick that they are not particularly interested in you as an individual nor in your company. They want to know that your company is reliable and has resources capable of rendering the kind of service they want. The prospect does not care whether you need business or not. Least of all does he want to hear any comparison between your brick and your competitor's brick.

Keep *Yourself* out of it as much as you can and think always of the PROSPECT. You cannot sell yourself to him by any direct statements about yourself. He will judge you by the truthfulness of your statements about your product and your firm, by your knowledge of your product and of his needs and by his own impressions of your personality.

Confidence Precedes Sale

The foundation of a sale is confidence. You must establish with him a belief in you and your product, and this is best accomplished by making only conservative statements which can be proven, by avoiding any knocking of competitors' material, by showing that you have studied his needs and that you are approaching him in the spirit of service.

There is a vast difference between these two approaches:—"I want to sell you this brick" and "This brick will make your building the most attractive one in its section of the city." The customer is interested in the last statement but not in the first. You should go to your prospect fully equipped. Can you imagine a lawyer, trying an important case, waiting until the day of trial before studying the case? The sale of an order of brick is just as important to your career as the winning of a suit in court is to an attorney. Learn all you can about the buyer—his habits, his likes and dislikes, his credit, his reputation as a builder or architect or as a business man. Learn as nearly as possible his particular needs in building material. Then try to put yourself in his place and decide what information or service someone could bring to you at just this time which you would be glad to have. Then equip yourself to render that service to this particular prospect.

Always take with you something to leave with a man —a pamphlet or booklet about brick, or an album of photographs showing buildings built with your brick which perhaps you will only lend him, not give him. If you can't close him on the first interview, always "leave the door open," so to speak, when you go out. By that I mean, leave the interview unfinished so that there is a good excuse for you to return. Tell him you have something else you want to bring him in the way of literature or information. Ask him when it will be convenient to see him again. Get him to ask you for some special information or service, if you can, then be very *PROMPT* and *ACCURATE* and *THOROUGH* in getting it to him.

Conserve Customer's Time

Don't take any more time with a busy man than is absolutely necessary, and the instant that you perceive that he wants you to leave, go out promptly, with the request that you would like to see him at another time when he is not so busy. If you do close the sale, don't start to talk it over with him afterwards. Leave just as soon as your necessary business is completed.

It is best always with busy business or professional men to make an appointment by telephone. In talking with them on the 'phone, don't get into your sales argument at all. Simply sell the desired interview. They will usually ask, "What do you want to see me for?" Rather than say, "I want to sell you some brick," say that "I have a matter in mind concerning your new building that I want to talk to you about." If they are real insistent on knowing exactly what you want to see them about, I would try again to avoid getting into the selling canvass by saying, "I have something that I really believe you would be interested in and if you are busy now, could I see you sometime tomorrow or some other day?"

If you simply say to your prospect over the telephone, "I want to see you about selling brick," and he hasn't any particular inclination to give you an interview, it is very easy for him to say, "The brick have been purchased." Then ethically you have no right to talk to him about an order. So by every legitimate means try to get him to see you without letting him know directly what you want to see him about. This is very important.

With the brick salesman, it is an easy thing to say to the man with whom you are trying to arrange an interview, "I have such and such a book that we are placing in a few of the better architects' offices (if it is an architect you are talking to) that I would like to bring over to you." The use of literature is just as useful in approaching the contractor or prospective building owner. Always be equipped with plenty of literature on brick.

Brick Substitutes

NOT because their importance entitles them to such a place of prominence, but because some salesmen think they are important, I would like to deal here in the beginning with the subject of substitutes for brick. I am anticipating the reaction to the quality argument in the mind of many who are selling or trying to sell brick.

"Yes, that quality idea is all right until you go out to sell brick against some of these cheap substitutes to a builder who makes cheapness the first consideration." That is what some salesmen are saying.

The reason the builder sometimes makes cheapness his first consideration in selecting materials is because an uninformed buying public allows him to do so. It requires a good salesman, indeed, to sell a house built of substitutes to a man or woman who is thoroughly informed on the quality of brick construction. Cheapness alone is not responsible for the sale of the substitutes. Good salesmanship and a powerful and consistent advertising effort are the biggest factors in the acceptance of materials that are displacing brick.

A house builder told me recently, "I have had salesmen call on me to sell lumber, concrete block, hollow tile, metal lath, stucco, celotex, creo-dipt shingles and every other kind of building material that I have ever heard of, but never yet has a salesman called on me to try and sell me common brick."

I know of a city with approximately a million population where there is not one common brick salesman. There come to the offices of the brick companies of that city, over the telephone or by mail, orders for about two hundred million brick a year. In that city several plants thrive on the manufacture of concrete block, concrete tile, cinder block, cement brick and sand-lime brick.

As soon as a hole in the ground is started, salesmen for the substitutes swarm about and if they do not get an order it is simply because the builder is a confirmed brick user or he is building for a client who demands brick. The salesmen for the substitutes have no opposition whatever except a long established preference for brick. Every one of these substitutes has come into that city since the building revival of 1921. Prior to that time all construction in that city was either brick, concrete or wood. The substitutes have gotten a foothold which they could not have had if the brick business had expanded to meet the growing demand for fire-resistive construction.

The chief competitors of brick in the order of importance are:

1. Concrete
2. Concrete products (large units)
3. Lumber
4. Hollow tile
5. Synthetic brick.

Under lumber properly belong all types of frame construction, including:

(a) The all-wooden house with clapboard siding or shingles on the outside.

(b) The wooden house veneered with stucco on wood lath, metal lath or any of the patented stucco bases.

(c) The frame house with a veneer of brick on the outside.

Lumber leads every other material in home building, and it is safe to say that out of every 100 houses built in the United States somewhere between 75 and 80 of them are frame houses of one of the types mentioned above. It is really foolish for the brick salesman to consider any other material as a more serious competitor than lumber, in the home building field.

Confining the argument for a moment to houses alone, the next important competitors of brick are concrete products, either sand-concrete block or cinder-concrete block. These large units are sold largely upon the claim that they are more economically laid in the wall than brick. The success of these materials is measured by their manufacturers in terms of the number of common brick displaced. The newest type of concrete block is one with a burned clay aggregate instead of gravel or cinders.

Use of Concrete Units

It is stated, and perhaps is true, that the quantity of concrete block used at the present time equals in cubic wall space the quantity of common brick used. There has been a tremendous growth in the production of concrete block during the past few years. Their markets first were found in localities where brick either was not made at all or was not aggressively promoted. In the larger centers concrete block was used mainly for the building of foundations of the cheapest type of small houses.

There probably is no type of house that has been more difficult to sell to the public than the stucco house. A tremendous advertising and selling campaign is being carried on simultaneously by the manufacturers of all of the materials entering into stucco construction. This type of construction has opened new markets to concrete block. Not until all effort to use concrete block as an exposed material was abandoned did it begin to make gains.

Concrete products or synthetic units made in brick sizes are not important competitors of brick except in a few local instances. Sand-lime units thrive mainly in sections where brick is not made. Concrete units in brick size are becoming less and less a factor. Many of the largest plants erected and equipped to make this material have either gone out of business entirely or been converted to the manufacture of other materials.

It is not the purpose of this book to provide any "knocking" material. I do not believe that anything is to be gained by depreciating competitive materials. Brick should be sold upon its merit. To meet the exaggerated and often damaging claims of the synthetic material, the salesman for brick is entitled to the facts regarding the comparative quality of brick and the materials sold as substitutes for brick.

Sand-Lime Units

Although least important as a competitor, probably the best synthetic product in brick dimensions is sand-lime, when well made. It is possible to make a durable unit with sand and lime. In some sections where clay is not found this material has been used for many years with success. Like every other synthetic product, however, the human element enters into the manufacture to such a degree that there is widely varying quality in the product. Some very poor sand-lime brick is made in this country and failures have resulted from poor quality which have been damaging not alone to the sand-lime industry but to the brick industry in general. The layman often mistakes all material of the general size and shape of brick for brick.

No all-brick wall in the Florida storm suffered the slightest damage.

Both fire and strength tests have been made of brick and sand-lime units under comparable conditions.

The chief point of difference between brick and sand-lime as revealed by these tests is that sand-lime is much inferior to brick in average compressive strength and loses a considerable percentage of its strength by exposure to high temperatures, while brick loses little in strength and is capable of supporting a load after exposure to fire.

Brick Retains Strength

In some cases the strength of the individual brick has been increased by fire tests. In sand-lime panels, where the brick were manufactured from ordinary bank sand, units have lost strength by exposure to fire to such an extent that they could not be considered safe to sustain loads. Sand-lime, as ordinarily made, does not compare with brick in the matter of retaining its integrity through fire. Even sand-lime in which silica sand is used loses a percentage of strength far exceeding that of brick.

The bond between mortar and sand-lime units is not as strong as in brick masonry and there is far greater danger of collapse of sand-lime brick walls from wind pressure or other transverse stress than in a brick wall as ordinarily built. This point of difference, in my opinion, is legitimate for the brick salesman to use in selling brick where his competition is sand-lime, and where fire resistance and strength of masonry are important factors in construction.

Responsibility Outweighs Cost

In the building of schools, theaters, churches or other places which at times house large gatherings of people, there is a particular point of advantage in the use of the real article—brick. No school board, no theater owner should take the chance of using anything but the best and safest material when it is available. A difference in cost of a few hundred dollars, or even a few thousand dollars on a large operation, is insignificant compared with the responsibility for a catastrophe resulting from the failure of a less substantial material.

It is a mistake for a brick salesman to indiscriminately condemn any substitute. It is as important to the salesman to know thoroughly his competing materials as to know his own material. Concrete block, with both sand and cinder aggregate, have been tested for fire resistance by the Underwriters' Laboratories.

Compression Strength Compared

But when their strength and fire resistance are compared to those of brick, the results are distinctively unfavorable. The strength of concrete block, specially made for the test, was 1,169 lbs., per sq. in. (average) and of cinder concrete block—790 lbs. per sq. in. (See chapter on Brick Strengths.) And their fire resistance, as determined at the Underwriters' Laboratory on blocks made specially for the tests, was also much less than for brick.

The human element enters strongly into the manufacturing of block. The block tested in the Underwriters' Laboratories may vary widely from the block being sold in any part of the country. Quality of concrete or cinder block depends upon the proper quantity of cement in the mixture, upon proper mixing, upon the right kind of aggregate, upon sufficient curing and ageing. The quality of a concrete block cannot be determined by its appearance. The only adequate test is a laboratory test.

On the other hand, a brick does reveal its quality at sight to everyone accustomed to its use. Its degree of hardness can be told by sight frequently, and if not by sight then easily by handling. Well-burned brick will give a metallic ring when struck together. Every bricklayer and mason and architect knows this fact.

Sand-lime when well made costs as much as brick, and never can be a serious competitor when brick is made efficiently. The same is true in a large measure of concrete block and brick-size concrete units. Cement, sand and gravel cost money and high grade units of these materials cannot be made to undersell brick.

Competent Workmanship Assured

The argument against brick most frequently used by the sellers of the large units is that brick are more expensive to place in the wall; that block may be laid by unskilled workmen, while brick must be laid by an expert bricklayer. This argument should be turned to an advantage for brick. The great integrity of brickwork and its unfailing satisfaction under all conditions and through long periods of time are the result of its having been done by an expert. The fact that brick must be laid by a skilled craftsman is the best guarantee of the safety and durability of brickwork. The laying of masonry is a job that requires skill. The preparation and use of mortar, proper aligning of wall, bonding and building of footings are not jobs for the novice.

In all masonry there is likely to be some settlement, due to the heavy load upon the soil which supports it. The larger the unit, the greater the tendency to cracking by settlement. The small unit wall, such as a brick wall, is much more flexible than one built of large units.

There is no masonry which loses so little of its strength by high temperatures as brickwork, and the ability to sustain its normal load under fire exposure is important.

Arguments for the use of brick in competition with concrete and cinder block and other substitutes, said to be cheaper than brickwork, will be dealt with in other chapters specifically in connection with different kinds of buildings and various features of construction.

Underwriters' Rate Block

When these materials are advertised or sold for "fireproof" construction, it is well for the brick salesman in meeting this competition to note that the Underwriters' Laboratories of Chicago in the summary of the report of fire tests on hollow concrete building units, published in May, 1924, says that, "Important loaded walls of these units may not be classified formally under the standard specifications as better than 15 minute retardants, the critical point being the development of cracks near the exposed face in end shells and in interior webs, the occurrence of this cracking affecting the stability of the wall as least as regards its continued use after the fire exposure conditions are removed."

Brick for Foundations

NOT many years ago the brick manufacturer, especially in the smaller cities and rural communities, found part of his market in the foundations of frame buildings and in the commercial, industrial or school buildings erected in his community. In many parts of the country the manufacturer has allowed the foundation market to get entirely away from him. It has been done by superior salesmanship on the part of the concrete interests and the supply dealers who sell cement and block. This business can be redeemed and is being redeemed in many sections. Practically all houses built prior to about 1900 have foundations either of stone or brick. Brick foundations have been absolutely satisfactory.

The turn to another material was not due to any lack of performance on the part of brick foundations. Every builder knows that a good brick foundation gives him a talking point in the selling of a home. When properly built, it is the driest foundation and the least likely to crack or disintegrate. It makes the best looking basement and is best adapted for finishing off rooms for any purpose in the basement. The exposed brick of the columns or underpinning add to the beauty of any house. This last feature is demonstrated by the frequent use of a veneer of brick over concrete in the underpinning of homes. Where the foundation is brick throughout, this veneer is not necessary.

It has been proven that the same kind of salesmanship that has sold concrete block for foundation use will redeem the business for brick. Few builders will be found who are unwilling to pay the small difference in cost to have a brick foundation if the matter is brought to their attention at the proper time and with proper force.

Double Forms Necessary

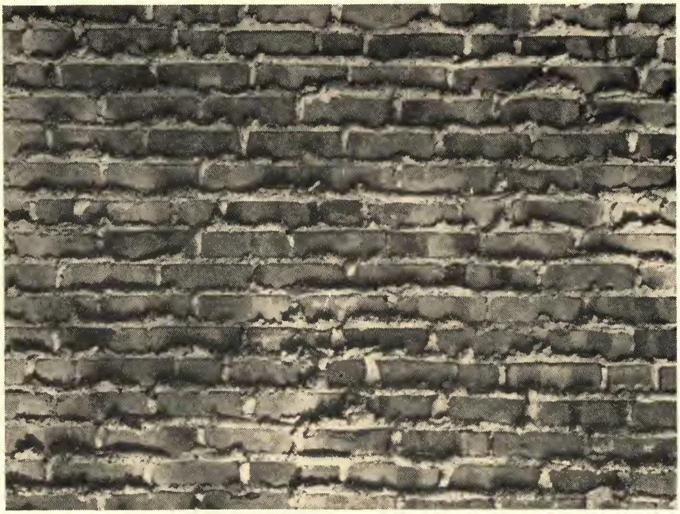
In one city where poured concrete foundations had taken nearly all foundation business away from the brick manufacturer, a study on the part of the brick interests revealed that the code allowed concrete foundations to be poured with only one side of the form erected, the earth being used as the other side of the form. The builder dug his excavation slightly larger than its finished inside dimensions and erected wooden forms supposedly at a distance of 8″ from the earthen walls of the excavation, then poured the concrete.

While the code required 8″ of poured concrete for a frame dwelling it was found that the forms almost invariably were placed closer than 8″ from the top of the earth and that at the bottom the width between the earth and the form frequently was reduced to two or three inches. In other words, where an 8″ poured concrete foundation was required the builders were getting away with a foundation not more than 6 or 7 inches at the top and 2 or 3 inches thick at the bottom.

A representative of the brick people called the attention of the building commissioner of the city to this violation and an ordinance was passed requiring double forms and inspection became more rigid, so that the builder was required to actually place an 8″ poured concrete foundation. The extra form increased the cost of the concrete foundation and of course the enforcing of the code still further added to the cost of the material, with the result that the difference in cost between the poured concrete foundation and a good substantial brick foundation was so small that there was immediately a swing back to brick foundations. In other cities the brick manufacturers have redeemed a large proportion of the foundation business by promoting Ideal wall for this use.

Where codes permit the use of hollow units in foundations, then the hollow walls of brick may be offered, and by the use of this construction the first cost difference between brick and the larger units or poured concrete is practically eliminated.

Brick foundations for large public and industrial buildings possess many advantages, both to the builder and owner, and this business should be vigorously cultivated. Brick foundations for large structures require no expensive forms nor special plant to construct, can be built in about the same time taken to erect forms for concrete foundations and the superstructure can be started at once, without waiting for the foundation to set and cure, as is necessary with concrete foundations. Considering the value of time, the brick foundation is just as cheap and the whole structure proceeds from foundation footings to parapet copings without delay.



Skintled brickwork, with a mortar overhang, one of many types of "Skintling."

Hollow Walls of Brick

EARLY in the experience of The Common Brick Manufacturers' Association it was realized that for many classes of construction solid brickwork, admittedly the best kind of construction, was stronger than the imposed load required. The brick salesman frequently had to meet the argument of the owner or the architect that—"of course we admit brick will be better in this particular place, but it is too good. We can just as well get along with something cheaper." The brick salesman, I fear, had been accepting this answer and as gracefully as possible stepping out of the picture. The Association found ways of producing a lower cost wall with brick, giving to the construction the advantages of high fire resistance, strength, permanence, good appearance, self-decoration that are peculiar to brick alone, and at the same time matching the first cost of substitute materials.

The only way to make a brick wall cost less is to use fewer brick and less labor and mortar. The hollow wall of brick does these things. Without for a moment relinquishing the claim that the solid brick wall is the best known construction, there has been produced a wall of brick to be used where hollow walls of any other type are sufficiently strong and fire resistive and are permitted by codes. It was gratifying to find that in perfecting the hollow wall of brick we have a wall of greater strength and greater fire resistance than any other hollow wall.

Brick Hollow Walls Resist Fire

Any large building unit containing voids or air spaces is subjected to unequal expansion under high temperature. This causes the large units to crack under fire and the surfaces exposed to the fire are likely to fall off, thereby greatly weakening the construction. A hollow wall built of brick is superior in fire resistance to any other hollow wall because the brick itself will withstand as much fire when built in a hollow wall as when built in a solid wall. Again, in case of settlement, the small unit has the advantage of greater flexibility and the expansion is taken care of through the innumerable joints in the masonry.

Hollow Walls Tested

Hollow walls of brick have been tested for fire in the United States Bureau of Standards, and have received a high rating which makes them adequate fire protection in about all types of structures. The burning of the usual contents of a residence, for instance, does not produce an intensity of temperature high enough to injure, to the slightest degree, hollow walls of brick.

There are two general types of hollow walls of brick, both identified by the name of Ideal walls. In all-rolok, all of the brick are laid on edge. With rolok-bak, only a part of the brick are laid on edge and the others are laid in the usual manner. The all-rolok wall is again subdivided into two types—one producing a pleasing exterior appearance and used where the brickwork is exposed. The other, less expensive to erect, and sometimes used as a backup material for brick, stucco or other facing. The all-rolok wall may be built in thickness of 8 inches or any greater thickness desired. The rolok-bak wall presents the same exterior appearance as ordinary brickwork. All the brick in the face of the wall are laid flat and any desired bond or pattern may be accomplished. The brick in the back of the wall are on edge and are bonded into the facing brick.

There are two other types of hollow wall built from standard brick that are in use principally in Southern California. One is known as the Simons wall and was invented by Walter S. Simons of Los Angeles. It is similar to the Ideal wall, except that the header brick used in this construction is a special shape with round ends fitting into the inner and outer withes of the wall. The header is not exposed on the surface of the wall.

Simons Wall Is Dry

The Simons wall calls for the dipping of each header in a solution of distillate and asphaltum. This application fills the pores so that it is impossible for moisture to penetrate through the header to the inner course of brick. This wall has been used with success on a number of jobs in Southern California.

Another wall, which also was developed by Mr. Simons and others, is known as the California wall. In the construction of this wall a "soap" brick is used which is one-half of the standard size brick cut lengthwise. In other words, it is a unit about 2½"x2"x8". As in the other types of hollow wall, the two outside withes of brick are built up in the usual manner and a standard header brick is used to bond the two withes together. The header brick, however, rests upon only one-half the width of the withe and the soap brick is used to hide the header. This also is an economical, strong and dry type of brick hollow wall.

Like anything else new, promotion is required to win acceptance of Ideal walls. Hollow walls are being extensively used where the manufacturer has considered it necessary to meet the competition of other types of hollow wall and has put proper enterprise into his promotional work. Obstacles will be encountered wherever hollow wall is promoted, but the obstacles are not as great as many new materials have to encounter. Ideal walls employ an old and tried material.

If the same effort is put back of Ideal walls that has been given to concrete block, this type of construction will sweep the country. Ideal walls may be employed as a backup material for any facing material, or they may be used as a completed wall. They may be used in curtain walls, partition walls or wherever any form of hollow unit construction is permitted. Hollow walls of brick give the brick manufacturer the answer to his question, "How can I meet the competition of concrete block and other so-called cheaper building units?"

Ideal Wall Factors

There are three or four elements to be dealt with in establishing brick hollow wall construction.

First, the building code must permit hollow walls of brick. In many building codes no special section is required, because there is nothing to prohibit the building of hollow walls of brick. Where there is a clause in the building code requiring that hollow walls of brick shall contain the same quantity of material as required in solid walls under the same conditions, then it is necessary to get a special ordinance passed. This is not difficult to do. The Common Brick Association will furnish copy for such an ordinance and assistance in having it adopted.

Second, the builder must be shown the advantage *to him* in meeting cheap competition by the use of hollow walls.

Third, the bricklayer must be shown that hollow walls increase the use of brick by reducing construction costs, and that its popular acceptance will give him more work—not less work. There are no mechanical problems involved in laying Ideal walls.

Note—See "Brick—How to Build and Estimate" Section describing all types of Ideal wall, illustrated with detail drawings and photographs.

Artistic chimney treatment helps, Raleigh, N. C.—too frequently these opportunities are overlooked.

New Markets

HOW many salesmen for brick, at times when orders were not plentiful, have taken their flivver and driven up and down the streets of their city to look for places where brick is needed for some improvement or addition to existing buildings? I contend that a salesman with creative ability can carry his plant through a prolonged dull period of construction with small orders picked up as a result of such an inspection trip.

A chimney may need rebuilding or retopping. A gravel sidewalk will suggest the building of a permanent brick walk. A cracked or dilapidated concrete walk or retaining wall gives a lead for the sale of brick to replace the unsatisfactory construction. Many a home owner will accept the suggestion that a garden wall, possibly to hide an unsightly garage, be built.

In every city there are many old frame houses, valued by their owners for their splendid interior construction or for their associations, where the expense of exterior painting and repairing every few years equals the cost of overcoating the house with brick.

On many streets the lot level is above the sidewalk, and with every rain, dirt is washed down upon the walk. A retaining wall here would add to the beauty of the place and eliminate a serious nuisance.

Protect Lumber with Brick

Lumber yards are always a serious fire hazard. Fire walls of brick built up between the lumber piles reduce fire insurance and would save loss in the event of a fire. The salesman should first get from a local insurance agency information as to rates with and without the fire walls and prove to his prospect that the building of fire walls is a good investment. These and a score of other opportunities for the sale of brick will suggest themselves to any salesman who goes out looking for them.

A man in Vancouver, Washington, has invented and is building many brick furnaces in the homes of that city and Portland. In another city a builder keeps fairly busy erecting brick waste burners and incinerators. Instead of a dangerous and unsightly bonfire in the back of the lot, it is much better to have a small brick stove in which all waste paper and other refuse may be thrown and burned from day to day without danger of sparks setting fire to nearby buildings. Develop a builder of Economy wall garages. There is enough work of this kind in any town to keep one builder busy and it will consume a large quantity of brick.

Possibilities of a Fireplace Order

A young salesman in a large selling organization made a big reputation for himself by being the first in the organization to conceive the possibility of selling a brick house to every person who came in their display room to look for brick for a fireplace or underpinning. Nearly everyone who builds a home has one or more fireplaces. As brick is more used for this purpose than any other material, very often the man and his wife go to the display room to pick out the brick for the fireplace. This concern, one of the largest building supply companies in the country, had been in the habit of selling a few hundred brick for the fireplace and being satisfied. This young man, new in the organization, in selling his first customer the brick for a fireplace said, "Have you bought the brick for your house?" "Oh! we are building a frame house," said the prospect.

There is right where the salesman began. He told them of the advantages of the brick home by showing some photographs of homes and giving them the exact cost of their construction—homes that they could look at in their own city. He convinced them that a brick house, although costing a little more in the first place, actually cost less in the long run. Before they left the display room they had selected a brick which they would like to use in a brick house, and they left with the promise that they would talk to their contractor and see if the building could not be changed to brick.

Of course, this salesman did not sell every prospect a brick house, but out of the scores who came to buy a few hundred brick he sold a considerable proportion a brick home before he had finished with them. He did not end his effort with an interview in the salesroom. He followed up the prospect. If their own contractor discouraged the changing of the house to brick he would ask their permission to bring them an estimate from another contractor whom he knew would figure brickwork legitimately. He proved to them that his statements regarding the economy of the brick house were truthful. He took them out in his car and showed them brick houses similar in size and style to the one they proposed to build. Now it is a rule in that organization that every person who comes in to buy a small quantity of brick be given a thorough canvass on a brick home.

A beautifully clean-cut whitewashed common brick home; Southern California.

Other Markets for Brick

IT should be kept in mind that there is an unlimited market for brick in structures other than homes and buildings of the standard types. Some of these structures are of such importance as to justify special literature, such as—"Brick Silos and Storage Bins," "Farm Buildings of Brick," and "Farm Homes of Brick." The amount of brick which might be sold for these so-called minor structures would amount to a very respectable total at the end of a few years. A few of these special uses are mentioned herewith.

Brick for Interior Use

In addition to the use of brick in partition walls in buildings of all kinds, brick masonry has distinct advantages for use in such places as interior courts, enclosed porches and interior walls of houses. Often it is possible to obtain very beautiful effects in such places as billiard rooms, conservatories, living rooms and especially in the interior finish of basements.

It should not be forgotten that some of the most beautiful church interiors are done in common brick, and that common brick decorate the interior finish of such celebrated structures as the Mission Inn in Southern California and the Art Museum at Cleveland, Ohio, as well as many others throughout the country.

A well laid piece of brickwork requires no further finish and possesses a beauty all its own.

Garden Walls and Walks

There is no material which so lends itself to a variety of treatments, all producing most desirable effects, as does common brick in the garden. In garden walls and walks, whether they be formal or informal, the variety of colors and surface effects makes it possible to build these structures in many forms all of which are so attractive as to have the appearance of having grown up with the surrounding landscape, and at the same time be of the most durable quality known.

The brick salesman might well carry with him photographic examples of handsome garden walls and walks as well as photographs of buildings. For the charm of some of these beautiful things is almost irresistible.

Brick Silos and Storage Bins

We are so apt to think in terms of buildings that we often forget that brick silos, and more especially brick storage bins, offer a considerable market for common brick. When we realize that there are no better structures for the purpose and that they can also be erected for as little or less cost than substantial structures of any other masonry material, it should not be difficult to induce the prospect to build such structures of brick.

Both silos and storage bins with diameters as large as 18 feet and height as great as 50 feet can be safely built of a single withe of brick laid flat with steel reinforcing bars laid in the mortar joints. For silos this reinforcing is placed every fourth or fifth course and for storage structures, holding such materials as coal, grain, sand, etc., the reinforcement is placed at closer intervals. When so constructed they are amply strong and stable.

And when we consider that storage bins are frequently built in batteries of as many as 6, 8 and 10 bins, the amount of brick used constitutes a respectable order.

For the larger sizes, two withes of brick can be used and even the ideal hollow wall is well suited to this kind of structure. It is especially adaptable where the contents must be kept from freezing; for warm air may be circulated through the hollow wall and thus keep the entire contents above the freezing point. If you are not familiar with this kind of construction, you should carefully read our two books on silos and brick storage bins.

Filling and Service Stations

These also offer an alert salesman some of the best prospects for business, for fire-safety is a prime necessity in such structures, and attractive appearance can be better accomplished with brick than with any other material. Then, too, such structures (rarely more than one story high) can be economically built with any of the hollow walls or with the less costly 4-inch Economy wall. Truly here is an almost ideal market for brick.

Reinforced Brickwork

"Many mickles make a muckle"—in Scotland. *Brick* window and door lintels and lintels over open passages are pleasing and artistic and amply strong when a reinforcing rod or bar is laid in the mortar joint. This part of the structure need not be of pre-cast concrete or stone if the salesman shows the architect and builder how to do it in brick. It has been proven that reinforced brickwork—with the reinforcing rods laid in the mortar joints—functions exactly as does reinforced concrete. And many such structures as floor slabs, roof slabs, beams and girders of reinforced brickwork have been in successful use for many years. There is a tremendous potential market for brick in reinforced brickwork.

Brick Partitions

Referring to the chapter on sound transmission, it will be seen that there is a large potential market for the use of brick for even relatively thin partition walls. Such walls of brick laid on edge and plastered both sides are amply strong and highly resistant to sound transmission. They are rapidly laid and have been largely used in Detroit for office buildings, and in that locality cost not more than $3 per square yard finished. The brick salesman might well give serious attention to promoting this type of construction, not just in office buildings, but for such other structures as fire-safe homes and more especially for schools and other institutional buildings where sound resistance is an important consideration. There are often miles of partitions in these institutions which may well require millions of bricks.

A fountain and gold fish pond snuggling in the shadow of an artistic common brick wall.

The Speculative Builder

"THE speculative builder" is a name generally applied to the man or company who builds houses or apartments to sell. Not many years ago the speculative home builder confined his efforts to low priced houses, often building up an entire street or in some cases many streets of houses, all from one or two sets of plans. Perhaps the houses would all be alike as to floor plans, but with slight changes in the exterior, some having the gable toward the street, others with gables on the sides or variation of the porches or other inexpensive attempts to avoid monotony.

Gradually, the demand for better ready-built homes became apparent. The building of a home is a technical and intricate operation. Many people, with even large sums to spend for homes, are glad to avoid the hazard and the trouble of building their own home, and they would accept a ready-built house if it approximated their needs.

The speculative builders in some cities erect homes selling from $50,000 to as high as $100,000 each. I know of a few such who have sold many homes at prices far above $100,000 each. Such homes were designed by good architects. No two are alike. They represented the very best in architecture and in construction.

This is mentioned to show that there is no reflection upon the term "speculative builder," although sometimes this term is used to designate a class of builder who is in general disfavor. The speculative builder and the realtor builder who build honestly deserve credit because they have made homes available to people who would long have hesitated to enter upon a building operation for themselves. They have been developers of the cities of the country.

The Jerry Builder in Disgrace

Like the reckless driver who brings all motorists into disrepute and causes traffic restrictions, certain builders have taken advantage of the reputation of good speculative builders and have exploited the home-owning instinct. These builders are often referred to as "jerry builders" and the jerry builder today is in disgrace.

The architectural and building journals, even the newspapers in story and editorial, are condemning the builder who erects flimsy houses of cheap materials and sells them to people who are not well informed in matters of construction at prices which are equal and sometimes higher than should be paid for a home of good construction. The jerry builder usually is not well financed, which means that his financing is expensive, and he necessarily adds to the price of his home all of his bonuses, his high interest rates, his discount on mortgages, so that the small home owner has to pay several hundred dollars in the cost of his house which does not represent materials or labor. It is simply a penalty for poor financing.

The promotion of brick and clay products, or good construction of any kind, is sounding the death knell of the jerry builder. Advertising will educate the buyers of homes to the point of refusing to accept any house that does not measure up to good standards.

It must be considered, however, that the lower the price of the home the greater the number of them built and sold. So that this small house field is a very important field and will offer a tremendous market for brick if it can be converted to good construction. The jerry builder is the hardest man in the building field to sell brick to. He wants only the cheapest material. He does not care how quickly the house depreciates or goes to pieces after he has sold it. It is a common expression that these houses are held together by the wall paper.

Beware the Chicken Coop Type

Especially in the warmer climates of the United States, where frost does not have to be contended with, there has been developed a type of construction which is of the most temporary nature but which is often employed in building homes selling for as high as $40,000, $50,000 or $75,000 each. The outer walls of these houses consist of light studding, too widely spaced, covered on the outside with paper to which is tacked "chicken" wire as a base for one or two coats of stucco. The insides of the studs are lathed and plastered. These houses, all dolled up in fancy colors usually in Mission or Spanish style, fall like children's block houses under the stress of tornado or cyclone, They are veritable fire traps and are unable to withstand the stress of storm or exposure.

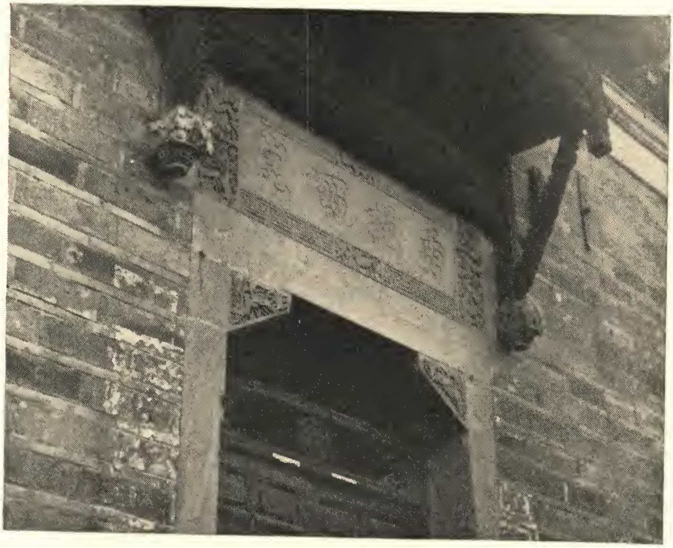
The brick salesman will have no difficulty in getting his share of the business from the legitimate speculative or realtor builder. He will, in my opinion, get business from the jerry builder only when the jerry builder has been converted to honest construction by the demand of the home buyers.

If on each day, for a week, two or three people call at a given drug store to ask for a certain brand of tooth paste, that druggist will call up his jobber and order some of that paste. When the jerry builder finds that the prospects who come to look at his houses say, "We want a brick house," and they refuse to buy his jerry-built house, then, and then only, will he turn to sound construction. The converting of the jerry builder is a job of educating the home buyer. This is exactly what is happening throughout the country. People with other types of houses for sale, even those that are well constructed, are finding that many of the prospects who come to look at their houses say, "We have made up our minds to have a brick house." This is the greatest influence upon the multiple builder of homes that can be exerted.

Use Local Advertising

In addition to the national advertising of brick homes, use local advertising. It should entitle you to some publicity in the reading columns. In your ads, tell again and again of the advantages of brick; stress the fact that the brick home over a few years actually costs less money than the type of home which has to be constantly repainted or repaired and upon which there is rapid depreciation and high maintenance cost.

The use of classified advertising space is effective in reaching the prospective home buyer. Insert small ads, say two or three inches in one column, in the classified columns where houses are offered for sale, suggesting to those who search the page that they will gain for themselves a great deal of comfort and save a great deal of expense if in seeking a home they demand a brick home—one with solid masonry walls all the way through.



Interesting Chinese brickwork. What seems to be the mortar joint is really a header, one inch thick, as much as ten inches wide, and running completely through the wall, generally ten inches thick.

The Architect

THE ethics of the profession prohibit the architect from advertising. It is my personal feeling that architecture should be advertised, because good architecture contributes so much to the beauty and the utility of buildings. The man building a home of moderate cost is inclined to feel that the architect's fee, which is usually 6 per cent of the total cost of the building, is an unnecessary expense, providing he can get a suitable set of plans at lower cost. This is a mistaken idea. The service of the architect is always worth more than it costs.

The brick salesman can do much to promote good architecture. He can say to prospective builders that he believes they should employ an architect. Long ago, other industries representing other building materials offered to the prospective home builder stock plans at low cost, so that the brick industry has been forced to render a similar service in order to compete.

The plan service of The Common Brick Manufacturers' Association is limited to homes of low cost, a field not considered profitable by the architect. The work necessary to prepare plans for a house costing $8,000 or $10,000 or even less, and the supervision of its erection, actually cost the architect more than he receives in fees. Representative architects of the country provided the plans for our service. This has resulted in better architecture in the small home and has not taken business away from the architects' offices.

Architect's Service Valuable

Even when stock plans are used, it is desirable for the home builder to consult an architect. This is especially true if any alterations are to be made. The architect's advice, as to the proper house for a given location, so that it may harmonize with its neighbors, is invaluable. Architectural supervision of construction insures good materials and good workmanship, and if the home builder has any doubt about the responsibility of his builder and is himself incompetent to properly inspect materials and workmanship he should by all means have an architect.

There is a popular belief that the architect is a difficult person for the building material salesman to reach. The brick salesman should realize that the architect is chiefly interested in beauty of structure and of materials. He is, of course, interested in economy of construction and always demands serviceability of materials. Since there is no question about the quality of brick, the brick salesman should devote his effort to presenting the "beauty" features of his material.

The effect to be produced in the wall by any given kind of brick is almost impossible to visualize from a sample of the brick itself. The mortar joint always is an important element in the appearance of brickwork. Even panels laid up in the display room fail to adequately show the beauty of brickwork. The best way to demonstrate brick is to show buildings in which it has been used with good effect.

It is not always easy to get an architect to go out and look at a building. It is even more difficult to get him to visit the display room. But if his interest is properly aroused he can be induced to look at erected jobs. If you can't get him to the job, show him a book of photos of beautiful brick buildings.

Today there is a growing appreciation of the effects in brickwork that can be produced with common brick. Common brick is any building brick which is manufactured primarily for structural uses without any special treatment to secure texture or color. This includes the overburned brick, clinkers, "lamies" and culls that are so popular today.

Common Brick Are Durable

All common brick possess possibilities of use which until quite recently were not fully appreciated. It is no new thought to the architect that any native material is suitable for use if properly handled. To the architect himself must be given the credit for the development in the use of common brick. When common brick was used for side walls or back walls of commercial buildings or in all the walls of industrial buildings, there was a tendency on the part of the mason to consider utility only and give no particular thought to appearance. Such walls usually are laid in common bond, which means six or seven courses of stretchers to one course of headers.

The same care was not given to the laying of common brick in the exterior of the wall as is demanded in the laying of face brick. Any common brick, if laid with care and with a mortar joint suiting the color and the texture of the brick itself, will give a satisfactory effect without the employment of any novelty in the bond. Where rough surfaces are desired, the same common brick can be laid in a fashion that is now widely known as "skintled" and a wide variety of effects are possible. The overburned brick or clinkers from the common brick kiln are in great demand for producing antique effects. In practically every city of the land there are good examples of what can be done with local common brick.

Common brick as a finishing material for a wall has two wide markets. First, it may invade the field of the frame or cheap stucco house where its low cost reduces to a minimum (often completely eliminates) the first cost difference between the brick and the frame house. Second, it satisfies those persons, whether architects or owners, who want rough surfaces, antique effects, or whitened or tinted walls, and who at the same time demand permanency.

Common Brick in Its Own Field

Common brick is not a competitor of face brick to an extent that deserves the slightest consideration. It is a competitor of frame and cheap stucco. It is a competitor of rough stone and rough stucco even in the better houses. It is particularly suitable in Italian and Spanish architecture or English architecture where the type or the location demand white or tinted surfaces.

Most ordinary common brick is a thoroughly durable brick. Walls of this material, sometimes whitened, are being used in some of the most pretentious residences built in this country today. Common brick does not require painting for protection, but that is no reason why common brick should not be promoted for use in buildings where white surfaces and permanency are desired. A painted brick house is more durable than any stucco finish that it is possible to build. The painting ordinarily has to be done but once. In many cases ordinary whitewash is purposely applied in such a way that it will quickly scale or wash off in spots, producing an appearance of age.

All these are points in which the brick salesman will find the architect interested. It is a new development in brickwork and when you can present something new, which already has the endorsement of many of the foremost architects of the country, you are sure to find general interest on the part of the men of that profession.

Literature for the Architect

The brick salesman should personally place in the hands of every architect in his territory a copy of "Skintled Brickwork." He should prepare an album of good photographs of skintled brickwork jobs in his city or vicinity to show to the architects. Where the salesman does not have local examples of common brickwork to show, he should equip himself with some photographs from other cities and make a special effort to get one or more local architects interested in this kind of construction. That is the way that skintled brickwork and the use of common brick generally has spread in this country.

The Common Brick Manufacturers' Association has prepared an album of 67 photographs of beautiful effects in common brick. Every brick salesman should have a copy of this album.

Photographs of houses entered in the 1927 competition constitute one of the most remarkable collections of brick homes ever put together. The full collection of prize and honorable mention houses, with all details, consists of seventy-two 8″x10″ prints. At 20 cents per print, no progressive brick salesman can afford to be without this collection. A look at them will convince any architect of the utility of common brick.

If the salesman sells common brick exclusively and cannot satisfy his customer with that material, he should do his utmost to create a preference for another clay product, even though he does not sell it. If the customer is completely sold on stucco, then the salesman will be doing him a favor to recommend that stucco be applied on masonry, either brick or hollow tile. Never try to give the architect information which you really do not possess. Don't be ashamed to say, "I do not know, but I will try to find out for you."

Brick cottages built for cotton mill employes in North Carolina.

The Engineer

THE engineer's interest in structural design is usually along two lines. A structure, in his hands, is an essential item in a plant for producing something and details of any structure are likewise thought of in terms of their utility. And secondly, he must know that a structure or structural part is able to meet the requirements of strength, fire-safety, and permanence. Common brick meets his needs completely in most cases. And his needs are well worth your best efforts, for they often require brick by the hundred thousand. Not only is he primarily responsible for the general design of factory buildings, but also for vast storehouses, warehouses, and storage bins, and for such other things as pipe tunnels, sewers, manholes, engine and machine foundations and many other things.

When you can show him (with data which our Association has made available) that common brick is amply strong, is unaffected by exposure to most anything except the stronger acids, is the most fireproof of all materials and is also of most pleasing appearance, you have just about met his specifications.

In times past, common brick was the engineer's favorite building material and it is yet with many of them. The insistent clamor and publicity of other products, mostly concrete, has diverted the engineer's attention, but an effort to direct his attention to the merits of brick should be well worth while.

It is desirable that all technical information be presented to the Structural Engineer by a technical man—a brick Engineer. Such an expert has a great advantage over the average salesman because he can actually render a service to the Engineer.

Technical Information

IT is probably true that our accumulated information about the physical and chemical properties of brick and brick masonry is as accurate and comprehensive as for any known masonry material. But outside of ourselves and a few others, the world in general has not been put into possession of this information. And while this technical data is dry as dust, it is highly important and may be a powerful factor in making a sale.

Those properties of brick masonry with which the professions and the industry are most concerned are: strength, fire-resistance, thermal resistance (or resistance to heat transmission), weather resistance and, to a lesser degree, sound resistance.

What is known about these various qualities is given herewith in as condensed form as possible. But it should be remembered that bricks made in different parts of the country, or indeed, from different parts of the same kiln, are by no means alike. Nor is all brick masonry alike. So that any values given here can only be average ones. They must therefore be used with discrimination. This is equally true of masonry made of any other material, for no other material is of constant or fixed quality.

Strength of Individual Brick

The ultimate compressive strength of individual brick is that property which is most important. The transverse, tensile and shearing strengths are also supposed to have something to do with the strength of brick masonry, but no definite relation has been established up to the present time.

The soft or salmon brick made in all parts of the country have a compressive strength of from about 1,800 to 2,000 pounds per square inch, and the compressive strengths of the better grades run all the way up to 20,000 pounds per square inch. It is probably true that 75% of all bricks sold in this country (except salmon brick which are specifically designated as such) have a compressive strength of 3,500 pounds per square inch or over. It is thus seen that even the poorest grades of common brick are stronger than any of the substitute materials, such as cement and sand-lime units, concrete or cinder concrete block.

Space does not permit giving an extended list of brick strengths for brick from all parts of the country, but most of these are known to individual manufacturers or to group secretaries.

Strength of Brick Masonry

The strength of brick masonry is, of course, not a fixed quantity, for this strength is affected by three principal factors, which are: individual strength of the brick used; kind of mortar used; and the character of the workmanship used.

There has been no definite relationship established by which we could measure the effect of varying these factors, but it has been shown that these factors do exert an influence even though the exact relationship has not been determined except in specific instances.

Up to the time of the recent extensive investigation at the Bureau of Standards there had been a total of approximately 454 individual tests on the strength of brick masonry, mostly, however, on brick piers and on wallettes. An indication of brick masonry strengths might be had from averaging the results of those tests which in any degree represent commercial workmanship. And by doing this we find that the average masonry strength of all tests laid in cement or cement lime mortar was 1,923 pounds per square inch. For all masonry laid in lime mortar the compressive strength developed was 1,206 pounds per square inch. This information can be taken as indicating the high strength of brick masonry.

The recent investigation at the Bureau of Standards was on 165 full-size wall panels. Four grades of brick, two kinds of mortar and two grades of workmanship were used. Tests were made on both solid and hollow ideal walls. The results have not been fully analyzed at the time of writing but some conclusions are already apparently justified. It is safe to say that brick strength, mortar strength and workmanship are the major factors affecting masonry strength. Workmanship especially has a great influence when the weaker grades of brick are used, but not such an influence when using the stronger grades.

Mortar Influences Strength

The wall strength when using 1:1:6 cement-lime mortar was roughly 85% of the strength developed when using 1:3 cement mortar. Hollow wall strengths were about 60% of solid wall strengths of the same thickness figured on the *gross* area in both cases. They were of apparently about equal strength when figured on *net* area only. In other words, an 8- or 12-inch hollow wall developed about 60% of the strength of an 8- or 12-inch solid wall, all other factors remaining the same.

The average wall strengths developed under various conditions were as indicated in the following table:

Bureau of Standards Tests—1926-1927

Brick Wall Strengths

C. S.=Compressive Strength, lbs. per square inch.

M. R.=Modulus of Rupture, lbs. per square inch.

1–3 Mortar=1 part cement and 3 parts sand.

1–1–6 Mortar=1 part cement, 1 part lime and 6 parts sand.

Brick Strengths	Kind of Wall	Kind of Mortar	Kind of Workmanship	Wall Strength
C. S.=3280	Solid	1–3	Poor	660
M. R.=1225	Solid	1–1–6	Poor	579
C. S.=3540	Solid	1–3	Good	1133
M. R.= 670	Solid	1–1–6	Good	947
C. S.=3410	Solid	1–3	Good	1510
M. R.= 820	Solid	1–1–6	Good	1232
	Hollow	1–3	Good	891*
	Hollow	1–1–6	Good	781*
C. S.=8595	Solid	1–3	Good	2712
M. R.=1550	Solid	1–1–6	Good	1840
	Hollow	1–3	Good	1030*
	Hollow	1–1–6	Good	822*

*Average for all types of hollow walls.

From this table it can be seen that even the lowest wall strengths developed are practically as great as most building codes require for the strength of individual units of concrete block—these requirements being from 650 to 750 pounds per square inch. And in this conncetion it must be remembered that brick wall strengths are about 25% of individual strength of the brick. And it is doubtful if the wall strength of substitute materials is as high as this ratio. With good workmanship for brick masonry this ratio can be 50% or more. As far as we can learn, there has been no test of wall strength of such units as concrete or cinder concrete block.

Fire Resistance

From the nature of the material and the method by which brick are burned at high temperatures of the kiln in process of manufacture, it might be expected that brick would have a very high fire resistance and this is the case. There is no material which has any higher. It is a further fact that furnaces for measuring the fire resistance of all kinds of material and all kinds of structural assemblies are built of brick. This in itself should be significant.

From the results of a very elaborate series of tests made at the Bureau of Standards, the National Board of Fire Underwriters have published (July, 1927) the following fire rating for brick masonry:

"Walls (exterior and interior) and Partitions built of common, hard-burned clay brick with cement or lime and cement mortar, conforming in height, loading and other limitations to requirements of the Building Code recommended by the National Board of Fire Underwriters; of good average workmanship and quality of materials, and built according to good current practice are shown to furnish protection against passage of flame and dangerous transmission of heat for the periods stated in the following classifications. The thickness here given as 12 in. is in some parts of the country designated as 13 in. Those terms are to be considered as equivalent."

Classifications:		Rating
4-in.	interior partitions. Non-bearing	1 hr.
8-in.	interior or exterior walls. Non-bearing, or bearing with incombustible structural members framed in	5 hr.
	Bearing, with combustible structural members framed in	2 hr.
12-in.	interior or exterior walls. Non-bearing or bearing. Not less than	9 hr.

"The foregoing classifications will usually be increased at least ½ hour by the application of portland cement stucco or portland cement or gypsum plaster ¾ in. thick, to either side."

This rating does not, however, govern the practice of all rating bureaus throughout the country, but is very largely accepted as a guide.

Thermal Resistance

Here again the values which have been published as results of various investigations and calculations should be used with discrimination because they can only represent the true value of certain specific construction. The following is taken from the November issue of BUILDING ECONOMY:

"The following values are the average values of five, but in some cases only one reference could be found:

4-in. brick, plain	0.55
8-in. brick, plain	0.39
12-in. brick, plain	0.29
16-in. brick, plain	0.24
20-in. brick, plain	0.21
4-in. brick, plastered on one side	0.54
8-in. brick, plastered on one side	0.37
12-in. brick, plastered on one side	0.28
16-in. brick, plastered on one side	0.23
20-in. brick, plastered on one side	0.20
4-in. brick, furred and plastered inside	0.37
8-in. brick, furred and plastered inside	0.26
12-in. brick, furred and plastered inside	0.20
16-in. brick, furred and plastered inside	0.17
20-in. brick, furred and plastered inside	0.16

These values represent the heat transfer per hour per square foot of exposed surface per degree (Fahr.) difference in temperature between inside and outside temperatures, all expressed in British thermal units (B. T. U.).

The smaller the value in the above table the better the resistance of the wall.

Walls Least Need Protection

Comparing these results with others which may be obtained from the Annual Guide of the American Society of Heating and Ventilating Engineers, it will be seen that brick walls without the use of a special insulating material have a very high thermal resistance. Those who advise special insulating materials would have us believe that all of the heat lost through any of the building goes out through the walls, but this is far from the truth. The real situation is well stated in the United States Bureau of Standards circular No. 151 as follows:

"It is probably true that unless special precautions are taken, most of the heat lost from our buildings passes out through windows and doors, so that no marked economy could be expected from increasing the thermal resistance of the walls."

And it should be further remembered that in most types of buildings, especially homes, a larger part of the heat is lost through the roof than through the side walls. Money spent in decreasing losses through windows, doors and roof will undoubtedly bring a much larger return than any money spent in increasing the thermal resistance of brick walls.

Don't Blame Brick for Leakage

It seems to be a fact that whenever brick walls show evidence of leaking or are damp, the brick is usually blamed for this condition. We have even had complaints where brick was used as a facing for a cinder block wall. A properly built piece of brick masonry is highly resistant to weather even though the brick themselves may be fairly high in absorption. The most common causes of wet walls are improperly set window and door frames, and such roof construction as permits water to gain access to the top of the wall.

In a recent case which we examined there was no attempt made to make window frames tight in the masonry. Water could easily blow in all around the window frames and especially under the sills and, passing through the interior wall, showed up several feet distant. It has been thoroughly established that brick having a fair degree of absorption, and especially with a fairly rough bed surface, tends to make a better and more waterproof mortar joint.

The building codes of many German cities require brick to have a minimum absorption of 10 per cent, and in some cases even higher. Where brick is properly laid, the most severe storm does not actually penetrate brick more than some fraction of an inch and evaporates rapidly after the storm is over. It is indeed rare to find an instance where the quality of the brick itself is responsible for a wet wall. There are instances, however, where the mortar is of such poor quality that water will pass through the mortar joints. Whenever possible, the brick salesman should use his influence to see that a good job of masonry work is done, for it will be later reflected in satisfaction to the customer.

All masonry walls for residences should be furred, lathed and plastered to guarantee absolute dryness.

Durability

The quality of durability of any building cannot be accurately measured by any laboratory test or experiment. Time, and time alone, can supply the test. It has been thought by some that such qualities as absorption, porosity, resistance to alternate freezing and thawing, would give some indication of the weathering resistance of brickwork, if they did not give an accurate measure of it. But the authorities now generally agree that absorption or percentage of absorption is not only no measure of weather resistance (as previously assumed) but that the results of the specified standard test for absorption (a 5-hour boil) may be entirely misleading as measuring durability. It is probable that the alternate freezing and thawing test may give some indication of durability, but the truth is that we have discovered no way to accurately determine in advance the durability of any brick or brickwork, or indeed of any other material.

It is true, however, that brickwork has been more widely used than any building material and for a greater length of time. Modern brickwork has been standing in structures now hundreds of years old and ancient structures of brick are still standing thousands of years after they were built.

The durability of brickwork is too well known to all to necessitate the introduction of any supporting evidence. Its durability or permanence is inherent in the brick as the result of burning a pure stable raw material into a finished product. And in this quality it is unsurpassed by any other material.

It should be mentioned in passing that the supposed permanence of some other materials is now being seriously questioned for the very reason that the necessary *time* has now elapsed to test durability in actual structures. Evidence is rapidly accumulating to indicate that some products are by no means the permanent ones which had been previously claimed for them.

Sound Resistance

The sound resistance of brick masonry is not so important as some other qualities, but may be called into question when brick is used in party walls or interior partitions. As might be expected, the more porous brick, having minute interior air cells, are more resistant to sound transmission than some of the harder grades. However, there is no kind of ordinary construction which possesses a higher degree of sound resistance than brick masonry. Special treatment with sound resistant material will, of course, add to the sound resistance of any kind of construction.

It has recently been found that partitions constructed of a single withe of brick laid on edge, plastered directly on both sides of the brick, are highly resistant to sound transmission, as well as being thoroughly satisfactory from the standpoints of strength and stability. Tests which accurately determine sound resistance have been made from time to time, but the results are expressed in such terms as mean little unless they are compared with those results obtained from tests of other forms of construction. These quantitative values are available in this office for any who may have use for them, but since the results are expressed as the logarithms of the volume of sound blocked off by the walls, they mean little to the laymen or even to the architect.

The significant fact is that brick walls and brick partitions as above described are more highly sound resistant than any other type of masonry construction. It has been proven that even the thinner partition wall entirely prevents the transmission of such sounds as are common in homes or offices.

This construction has become a standard for some of our more important commercial buildings and has been found to be thoroughly satisfactory.

In meeting the competition of other materials for purposes of heavy load bearing walls, fire resistive or sound resistive construction or when thermal resistance is an important factor, the average salesman needs help. One of the brick Engineers of this Association should be called upon to present the scientific data to the architect or engineer. The facts are all on the side of brick and it is unfortunate to have jobs go to other materials solely because these facts are not properly presented.

Whitewashed common brick house, North Carolina—a brand new field for promoting common brick.

The Building Code

EVERY brick salesman should be familiar with the building regulations of the community in which he is working. No building material may be used within the jurisdiction of the code, either city or state, except in compliance with such code. Some brick manufacturers are struggling with a market which is restricted unreasonably by building regulations.

It was the old-fashioned idea to assume that the thicker the walls required by building codes, the more brick would be sold. That might work and probably did work years ago when brick had practically a monopoly, but in this day when there are so many alternates and substitutes for brick, the code that is most favorable to the sale of brick is the one which calls for the minimum amount of brick consistent with safe construction.

Although the 8″ wall above grade for two or two and one-half story residences is in general use throughout the United States, there still are a few cities clinging to the old 12″ requirements. Wherever you find a 12″ requirement for brick and the code is open for the use of competing materials, usually of lesser wall thickness, you will find less brick used for residential construction.

If a city has been wise enough to protect itself against conflagration by extending the fire limits adequately, then the 12″ ordinance is often an advantage to the brick manufacturer. This association, however, advocates, always, the minimum safe requirements. The salesman should study the building code of the city or cities in which he is selling. If not competent himself to properly interpret the code, he should send it to the Engineering Department of the Common Brick Manufacturers Association, where it will be reviewed for him. If there are inconsistencies in the code or unwarranted restrictions or requirements, they will be pointed out and it should not be difficult for the local brick manufacturers, supported as they surely would be by the engineers, architects and builders, to have the code amended so that brick will have the freest possible flow into construction.

Brick Generally the Standard

Generally brick is accepted in code writing as a standard. Wall thicknesses are based upon the brick unit, being in multiples of 4″. It is rare to find a code that is prejudiced in its requirements against the use of brick, because brick is the oldest basic material and codes have accepted it and, in fact, require it to be used where heavy stresses or superior fire protection are necessary.

The usual activity of the brick interests in code work, therefore, is in opposing the lowering of the standards to admit other materials, unequal in strength or fire resistance, on a parity with brick. This sometimes places the brick interests in an unfavorable light and as a general proposition it might be assumed that the brick man should be interested only in the brick requirements of a code. However, when the activities of substitute materials take the form of attempts to influence legislation beyond the point of safety in construction, then the brick man need not be backward about interesting himself in code provisions bearing upon other materials than his own.

Bureau of Standards tests have proven the ability of brick to carry certain loads and to resist intense fire exposure for long periods. The strength and fire resistance of 4″, 8″ and 12″ solid brick masonry and of 8″ and 12″ brick hollow walls have been determined and fire rating standards set up by the United States Bureau of Standards.

Up to the time of the writing of this there never has been an authoritative test for strength of a wall built of either concrete block or cinder block. Timber, steel, mass and reinforced concrete and brickwork have all earned their place in structural rating by authoritative tests on full-size wall panels.

Equal Quality, Equal Rating

It is my belief that it is legitimate for the brick interests to maintain the position that any material which by authentic test has been proven to have a strength and fire resistance equal to brick should be admitted on a parity with brick, but that no material which does not test the equal of brick should be allowed as the equivalent of brick in construction.

The plausible appeal of cheapness is always made for the substitute material. There is a good sales argument in the fact that every building failure in this country can be traced to so-called cheap materials or cheap construction. In tornado, cyclone, flood or earthquake, the structures which suffer are always those which are built of cheap materials or of good materials cheaply erected. So far as I am able to learn, in all of the recent calamities of this country affecting building construction, no well-designed or well-built structure using good materials has been severely damaged. Violent earthquake shock may be excepted, yet practically all failures have been traced to poor design or poor construction or both.

There is a tendency at the present time, fostered I believe by politicians, to set up state building commissions or committees empowered with authority to pass upon building materials. State codes usually apply to the sections of a state outside of the municipalities which have their own building codes. The city codes are not affected by state codes except that they shall have no standards lower than those set up in the state regulations.

Unfortunately, the legislation which creates the state building authorities does not require the employment of technical or practically qualified men. A non-technical committee or commission, given the authority to admit any material which they choose to admit, offers unlimited opportunity for graft. All legislation of this kind should be carefully scrutinized by those who are interested in honest, sound, fire-resisting construction. The principle of a state building code is in itself correct, but the control and administration of such code should be in the hands of qualified technical men who could not be swayed by propaganda or by graft.

Fire Limits

There is a tendency today on the part of insurance interests and responsible engineers and builders to favor the extension of fire limits in cities. Practically every important city has a fire zone. This is usually confined to the so-called downtown center in which are located the largest and tallest commercial structures. Usually these zones stand as they were established many years ago and have not been expanded to conform to the growth of the cities. Some cities maintain, in addition to the downtown fire zone, certain secondary zones. These sometimes take the form of a border around the inner zone in which the restrictions are less rigid than in the inner zone. In other cities they include the frontage on important streets radiating from or intersecting the inner zone.

The ideal set-up for an extension of fire limits is a law giving local option in the establishment of fire zones. The City of Chicago has such legislation. Los Angeles has a similar plan. The owners of property in any block or precinct or ward may, by option, have that area declared a fire zone in which no inflammable exteriors of buildings of any kind are permitted. The building commissioners of cities, fire chiefs, the better architects and engineers always will be found on the side of adequate restriction in the form of fire limits.

The brick manufacturer or the manufacturer or dealer in any other fire resistive building material will be accused of selfishness if he promotes the extension of fire limits. That is, he will be accused of selfishness by those who with equal selfishness oppose such extension because it eliminates the kind of material they sell in certain features of construction within the fire limits. This should not deter the interested parties, however, from promoting fire limits. It is a reform of prime interest to any community.

In Southern California outdoor living rooms, with walls and floors of brick, are very popular.

Ethics and Standards

WITHOUT encroaching on that dangerous ground set apart by the anti-trust law, it is possible for organizations of brick manufacturers or dealers to agree upon certain standards and practices which do not bear upon the selling price of a commodity, but do have an immense influence upon the harmonious and profitable conduct of the business of such concerns. It is legal to have standard cost accounting, a standard size of brick, standard terms of credit and standard delivery or other service charges. It is difficult for men to engage in constructive and harmonious competition unless these standards are adopted and lived up to.

Soon after the creation of the Bureau of Simplified Practice in the Department of Commerce of the United States, the two brick associations, the American Face Brick and the Common Brick groups, asked that a standard size of brick be established. The Bureau of Simplified Practice canvassed the industry and the organizations which have to do with building standards and construction and established a standard size of common brick and all rough surface face brick as approximately 2¼"x3¾"x8" and of smooth face brick as approximately 2¼"x3⅞"x8".

These standard sizes prevail generally throughout the industry. The same standards recently have been adopted in Canada. These standards have the endorsement of the American Institute of Architects, the American Society for Testing Materials, the Bureau of Standards, the National Building Code Committee of the Department of Commerce as well as of the two groups of organized manufacturers. These are the standards which the professions who design and superintend construction prefer.

Observe Standard Size

There is no legitimate excuse for making any other than the standard size at the present time. The only incentive that I can think of for a manufacturer to make an oversize brick is to have an advantage over his competitor, but this is a short-sighted policy, because no manufacturer has a monopoly on oversize brick. The act of one manufacturer in violating the standard simply stimulates his competitor to make even a larger brick and there is no end to the competition in size except injury to the brick industry. The willful production of oversize brick or undersize brick tends to remove brick from the favor of the architect and builder, and, in my judgment, is opposed to the best interest of the brick business.

The enterprise and inventive genius of the manufacturer in creating new units or production of improved shapes or types of brick should not be discouraged, however. Standard sized brick should be standard size, as nearly as they can be burned to size. Other sizes should be promoted frankly as new units and sold at a price conforming to their cost of manufacture.

The old time merchant who "threw in" a pair of suspenders with the suit, I suspect, got paid for the suspenders. He only fooled some of the people a part of the time.

Sell brick at the price it is worth and don't pretend to "throw in" a few extra cubic inches of material.

Another important point is involved in the adoption of standards of all kinds. Every person who becomes a part of an organization gives up some individual rights in exchange for the greater advantage of co-operation. A manufacturer cannot expect others to be square with him in maintaining ethical selling methods, standards of credits and service if he is disregarding standard size.

The Bricklayer

WITHOUT the trained bricklayer brick would be a useless commodity. The brick-laying craft is sometimes spoken of as the neck of the brick manufacturers' bottle. Through this craft must flow into construction the output of the brick plants. By the same token, if brick were not made the bricklayer would have to find a new occupation. With such interdependence between the craft and the producers, it would seem that there should be the closest harmony and co-operation.

The work of standardization and promotion on the part of the brick manufacturers is directly in the interest of the bricklayer. The elevation and development and extension of the craft is decidedly in the interest of the manufacturer. Yet there has been the most unfortunate lack of sympathy and understanding between these two groups.

The Common Brick Manufacturers Association has, from its inception, deemed it a part of its duty to the industry to foster understanding and co-operation with representatives of and the rank and file of the bricklaying profession. The bricklayer is one of the most skillful craftsmen in the construction field. His record in unionism is highly creditable. His occupation being seasonal in most parts of the country, he is anxious for the greatest number of days work that he can secure. He is not looking for trouble and he often is the peacemaker among the building trades. Those who have brick to sell should cultivate an acquaintanceship with the organized bricklayers.

No Official Restriction

Contrary to many statements that are carelessly made and often printed, there is no rule of the International Union of Bricklayers which permits the restriction of output. The statement that the bricklayers' union is responsible for a shortage of apprentices in the trade is equally unfounded. The rules of the Union allow fully four times as many apprentices in the United States as are today in training. The brick manufacturer, knowing these facts, should deny at every opportunity the unfounded statements which tend to discourage the use of brick.

It is true that the bricklayer commands about as high an hourly wage as any man in the building crafts. It is equally true that the annual earning of the bricklayer is not large, due to the many interruptions in his work. This Association has found many local unions or state organizations of bricklayers ready and anxious to do their part in the promotion of the use of brick. I doubt if there is a group of bricklayers anywhere in the country who would not, if properly approached, join with the brick manufacturers and the dealers in carrying forward brick propaganda.

There are radicals among the bricklayers. In some groups they may dominate, but there are also radicals among brick manufacturers, merchants and ministers. The international officers, the district and local officers of bricklayers' unions are, by and large, intelligent, high-grade, home-owning citizens.

When the brick manufacturer understands these facts, which are stated simply as facts and not as a brief for the craft, and will approach them just as he would any other group whose co-operation is desired and necessary, the interests of the industry will be furthered.

Comparative Costs

THE brick salesman no doubt has to combat the fallacious idea that a brick house costs much more than a frame one; as some carpenter contractors tell the prospect, at least 25% more. Just how erroneous this statement is can easily be demonstrated if you can get the prospect to use his head, with a little guidance by yourselves. A specific example is the best answer.

In an ordinary dwelling, which uses about 40,000 brick and which costs in the neighborhood of $15,000 complete, the cost of the brick on the job, at $15.00 per thousand, is $600. In most parts of the country the cost of laying the brick in the wall, including the cost of the mortar and all other accessories, is about equal to the cost of the brick itself. In some places, of course, it is more. But suppose it costs even $25.00 per thousand to lay them, the cost of laying is then $1,000. The entire cost of the outer walls is then $1,600, and this is but little more than 10% of the total cost of the $15,000 house.

The only real difference in cost between a brick and a frame house can be the difference in cost of the outer walls above the foundation. What goes inside the house is essentially the same in both cases, including the foundation. From this cost of the brick walls should be deducted the cost of frame walls, which includes studs, building paper, siding and paint. When this cost is deducted from the total cost of the brick walls, it still further reduces the difference in cost to a point where the actual difference in cost of the whole house in brick and frame is rarely over 5% of the total cost.

Prove Low Cost Difference

By going through such a simple calculation with the prospect, it is easy to show him that there never could be such a differential as 25%.

When you have to meet the competition of other masonry materials in larger structures, it is difficult to establish any fixed unit costs for any material or for any particular job. We cannot say that brickwork costs so much per square foot and that reinforced concrete, block or tile also costs any fixed sum per square foot; for these unit costs depend upon many factors which vary from time to time and for each particular job, especially for different localities.

Brick should always be sold as a quality product. There is no other material which meets so many structural requirements, and since brick masonry is not expensive construction, the selling resistance of the material is lessened. The wide variation in bids for doing the masonry on a certain job will illustrate how difficult it is to establish any fixed unit costs. The character of the building, the season, the available labor supply, and many other items affect building costs.

Under some circumstances a brick structure is as economical to build as any, but it should always be kept in mind, and impressed on the prospect, that sterling worth is not naturally the least expensive and good brick masonry cannot be surpased for sterling worth.

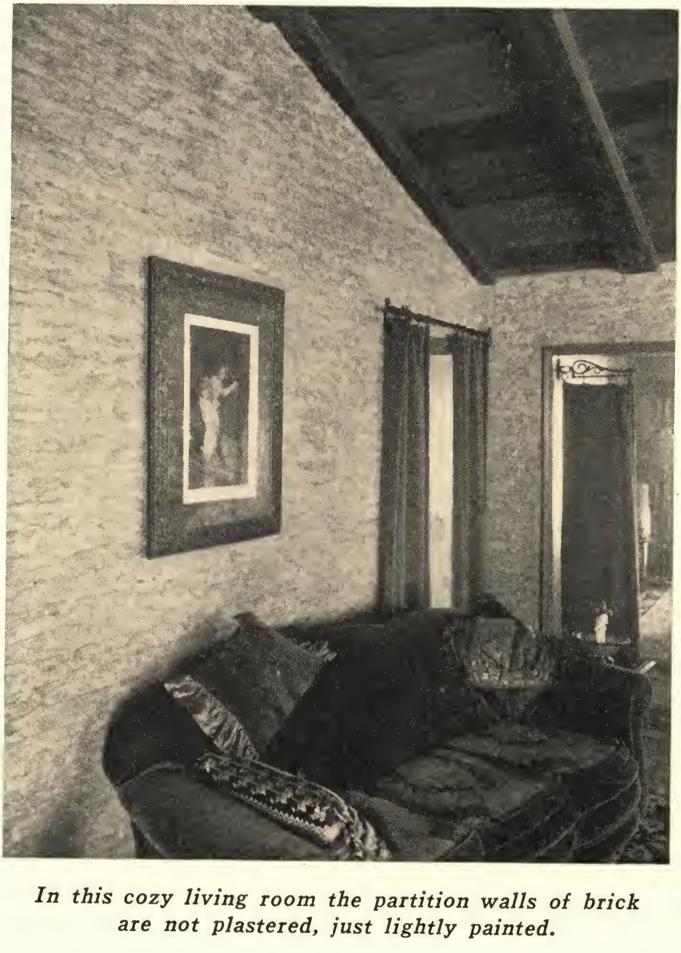
Denver Stops Controversy

A cost survey conducted in Denver in 1927, participated in by lumber, cement and clay products interests, took the question of comparative costs out of controversy as far as that section of the country is concerned.

A typical bungalow 25 ft. by 35 ft. in size, was found to cost $112 more with solid brick walls than it cost with frame walls.

Get a copy of the complete report of the Denver Survey from the C. B. M. A. or any district office.

A similar survey should be conducted in every city with lumbermen and brickmen co-operating and agreeing upon the plan and endorsing the result. The public is entitled to the facts. Both sides should be willing to give the facts.



In this cozy living room the partition walls of brick are not plastered, just lightly painted.

The Lumber "Analysis"

THE National Lumber Manufacturers' Association issued on February 1, 1928, a document entitled "An Analysis of Advertising Claims for Common Brick, for Use of Lumber Salesmen."

It is assumed that brick salesmen will encounter the claims made in the lumber analysis and therefore should be equipped with facts to combat the lumber salesman who parrots the misinformation that abounds in the Analysis.

The lumber analysis was prepared under the direction of the chief engineer of the National Lumber Manufacturers' Association, Frank P. Cartwright, formerly secretary of the Department of Commerce Building Code Committee.

Mr. Cartwright attempts to break down all of the principal claims of this Association as made in its literature and advertising. Most dangerous of all to the brick industry is his attempt to show that brick construction, as recommended by this Association, is of doubtful durability and serviceability, contending that the reputation of brick was built on the 12 and 16-inch walls.

Keep in mind that *this Association would be the last agency in the world to recommend the use of brick in a way to produce failure.* All our recommendations are based upon authoritative tests, principally those made by the United States Bureau of Standards. Although Mr. Cartwright knows of the brick tests at the Bureau of Standards, he ignores them and gives his opinions in direct opposition to the Bureau findings.

The analysis also attempts to prove, by unscrupulous juggling of reports made by the National Board of Fire Underwriters, that there is greater likelihood of a fire occurring in a brick dwelling than in one built of frame. The National Board of Fire Underwriters, however, is definitely on record on this subject, and you are given, later in this section, direct quotations from their reports which will show the falsity of Mr. Cartwright's conclusions.

The architect and practical builder will not be deceived by anything in Mr. Cartwright's pamphlet; only the uniformed in matters of construction may be misled. The purpose of this report is to equip the brick salesman with substantiating evidence for every claim made in behalf of brick which has been attacked in Mr. Cartwright's analysis.

The lumber analysis is summarized in 16 questions and answers. The analysis itself consists of 10 questions and answers, and this portion of the pamphlet, it is assumed, will go only to lumber salesmen.

Fact Statements Only

In answering Mr. Cartwright's arguments I will consider the 16 questions and answers making up his summary. A number of these deal with matters of taste or judgment. The answers to some of his questions cannot be reduced to a fact statement, and these will not need elaboration.

Let us now take up each of these 16 questions:

Question No. 1. "Do common brick dwellings make as good an appearance as those of lumber?"

Ans. "With good architectural treatment and excellent workmanship the common brick dwelling is attractive. Lacking these, it is drab and box-like, failing to equal in appeal the natural beauty of a lumber built home."

Good appearance of a building depends upon the taste or judgment of the individual. The best answer to the prospective builder is to ask him this question, "If brick homes are not of good appearance, why do we find, in almost every city and town, that a majority of the better homes in the better sections are houses of brick?"

The literature of the Common Brick Manufacturers' Association gives sufficient illustration of good-looking small brick homes to prove that beauty in brickwork is adaptable to the small house, as well as to the more pretentious house. There is no more necessity for making the brick house "drab and box-like" than for making the frame house pink and round.

Question No. 2. "Are brick dwellings easier to sell?"

Ans. "No. The lumber dwelling is by a wide margin the choice of operative builders as to salability. It is within the reach of a larger class of purchasers."

Our claim that brick homes sell easier is based upon the fact that throughout the country many builders are turning from frame construction to brick construction for this very reason. If this were not true, the common brick industry would not have been made the subject of this attack by the Lumber Association. It is because the lumber industry knows, as we know, that there is a marked gain in brick home construction, that it has sought to tear down the arguments of the brick industry. It is true that more frame homes than brick homes are built in the country, but the ratio is rapidly changing, and this the lumbermen admit.

Firesafe Homes Increase

On this point the National Board of Fire Underwriters says in its last report on "Dwelling Houses—A Code of Suggestions," page 100: "The public is gradually being educated to the advantages of incombustible homes, and the increasing price of lumber coupled with the skill and economy with which fire-resistive houses are now being erected, are all having an influence in supplanting wooden structures. These influences will continue to grow, and the future will doubtless see a gradual decrease in proportion of frame dwellings."

Question No. 3. "Are brick dwellings more durable than those of lumber?"

Ans. "The many lumber homes over a century old testify as to the durability of good lumber built homes. The experience of expert appraisers confirms it."

Argument hardly is necessary in answering this question. Everybody knows that brick homes as built today are more durable than frame homes as built today. The lumberman attempts to prove his point as to the durability of frame homes by reference to six old frame houses in New England and New York State, erected between the years 1660 and 1783. These old houses are no more like the present frame house in the manner of construction than the steamships of today are like the old wooden "windjammers" of the ancients. The few old wooden houses standing today were built with heavy, hewn timbers of hardwood, mortised and framed into each other. And even with this type of construction, which would be prohibitive in cost today, the houses have been restored, some of them several times, in order to preserve them for sentimental reasons. Mt. Vernon, the home of Washington, is an outstanding example of the ancient wooden house. Every American citizen may well be proud of this beautiful structure. This office is in possession of a photograph of Mt. Vernon taken before its last restoration in which it is shown to be in a most dilapidated condition. Those who visit Mt. Vernon may purchase a book in which this illustration is reproduced. National Geographic Magazine of May, 1928, shows a picture of Mt. Vernon on page 626 with this caption: "Decrepit Mount Vernon As It Appeared 69 Years Ago, When Acquired by the Ladies' Association." In referring to this house on page 624 of the same issue it is stated: "As a result, the place fell into a lamentable state of disrepair and was faced with utter ruin."

To build a frame house today to last one hundred years, without expensive maintenance, would cost much more than the finest brick house that could be built. As to the durability of brick structures, there are plenty of examples in this country and in Europe too well known to need further reference.

Mr. Cartwright's chief supporter in his attempt to give frame an endurance similar to brick is John A.

Zangerle of Cleveland. Mr. Zangerle's confidence in frame didn't apply to his own building, however. He built himself a brick house on Lake Avenue in Cleveland, in which he lives today.

Question No. 4. "Is a brick dwelling less expensive to maintain?"

Ans. "Slightly. A leading authority states brick houses cost three-fourths of one per cent to maintain; and a frame, one per cent. Excluding the walls, a brick house requires at least the same care as a lumber built home. Brick walls are subject to efflorescence and dirt accumulations.

This is closely related to question No. 3, and it is sufficient to take the lumbermen's answer, which admits that the brick dwelling is less expensive to maintain. They qualify their answer by saying that brick walls are subject to efflorescence and dirt accumulation which necessitates an expense in cleaning. I doubt if anyone who reads this book has ever known a case of a brick residence being cleaned. Efflorescence is of infrequent occurrence, resulting 99 times out of 100 from the use of cement in the mortar or from the use of imitation stone trim. Most efflorescence is washed off by rain. While it is true that buildings in the congested centers of cities have to be cleaned, rarely does it occur that a residence, usually found in the cleaner sections of the city, accumulates enough dirt so that cleaning or sand blasting ever would be necessary.

Do We Build for Keeps?

Question No. 5. "Does obsolescence affect brick buildings less than those of lumber?"

Ans. "No. Due to changing character of our cities, buildings are torn down long before their structural life has run. Obsolescence is more important than structural depreciation. Buildings of lumber can be more easily altered or adapted to new uses."

This question deals with obsolescence and assumes that buildings will have to be torn down because they have grown old-fashioned. Again Mr. Cartwright tries to confuse comparison between frame dwellings and brick structures, not dwellings. The best answer to this is to ask the prospective home owner if he builds with the idea that he will tear his home down within a few years due to its obsolescence. If his answer is negative, then he is interested in the economy of permanent construction—the ultimate cost more than the first cost.

Question No. 6. "Are painting costs more for a lumber dwelling?"

Ans. "Yes, somewhat. For an average lumber dwelling the extra painting costs approximate twenty dollars a year."

A good answer to this question may be borrowed from the Packard Motor Car Company, "Ask the man who owns one." Let any frame home owner, accustomed to the frequent expense of repainting, talk with a brick home owner about painting expense and he will get an answer that is not at all in line with Mr. Cartwright's estimate. In practically all cities it is necessary to paint a frame house every three years, at the best. The small amount of wood trim of a brick house is set back in the brickwork and protected, so that painting is not required as frequently as with the frame house. Brickwork never needs painting, and brickwork is almost 100 per cent of the wall of the brick house. Get any local painting contractor to give you estimates on repainting a frame and a brick house of the same size. The difference will be about in the ratio of 3 to 1 and the frame home requires painting oftener than does the wood trim of a brick house.

Question No. 7. "What is a good brick and a good lumber dwelling?"

In answering this the lumber engineer tries to discredit the 8-inch wall, the Ideal hollow walls and the Economy wall. We will let an official of the United States Bureau of Standards state the facts. Dr. H. L. Whittemore, Chief of the Section of Engineering Mechanics at the Bureau, who is thoroughly familiar with all of the tests of brickwork that have been made at the government laboratories at the instance of this Association, in writing for the United States Daily, March 21st, 1928, said:

Thin Walls Proven Safe

"The officials in our cities responsible for the building codes have in the past been hampered by a lack of experimental data on the strength of brick masonry, although it has been claimed that no brick wall has ever failed. If this claim is justified by the records it would probably show that it is customary to build brick walls thicker than is necessary.

"An investigation might show that thinner walls properly built would have ample strength or that hollow walls built of brick might be used safely and have the advantages resulting from the air spaces in the wall. If it can be proven that thinner brick walls (or hollow walls), requiring less material and therefore cheaper, are safe, the result will be less costly construction of homes and other buildings. The people of this country should be permitted by the building codes to save wherever possible as part of our national program of eliminating waste.

"With this purpose in mind an extensive investigation of brick masonry was undertaken in co-operation with the Common Brick Manufacturers' Association of America. During the past two years 168 walls have been built and tested under compressive loads. Many of these walls were 'full size,' that is, nine feet high and six feet wide. Different grades of brick were used with different mortars.

"For the first time, so far as we know, it was found that walls laid under supervised workmanship were very much stronger than walls laid by a contractor working in the usual way.

"The results of this investigation will undoubtedly have an appreciable effect on building construction by showing how this very ancient structural material can be used with greater economy and in such a way as to obtain a more satisfactory building."

Ignores Known Information

Mr. Cartwright was secretary of the National Building Code Committee when that committee issued its report upon dwelling-house construction. In that report both the 8-inch solid wall for residences and Ideal hollow walls are accepted. Mr. Cartwright states in his answer that the Economy wall is "economical and little else." The United States Bureau of Standards tests contradict this statement, and show that the Economy wall, in an average of 12 tests, required 57½ tons per running foot to crush it. Mr. Cartwright says that this wall is only a half-brick thick in places, whereas the truth is that no part of the Economy wall is less than a full brick in thickness, 4 inches, and the pilasters are 8 inches in thickness. Mr. Cartwright, by innuendo and some direct misstatements, attempts to throw doubt upon types of brick construction that have the approval of the highest authorities upon these matters in America. Strength of brick walls are given in a table in another section of this manual and these authoritative data will be accepted by anybody in preference to Mr. Cartwright's depreciating generalities.

Question No. 8. "How do good brick and lumber dwellings compare as to original cost?"

Ans. "The lumber built home costs much less, the difference varying with locality and price conditions. In most places a good brick dwelling of average size costs at least $1,500 more than a similar home built of lumber."

Mr. Cartwright devotes five or six pages of his pamphlet in an attempt to prove this false statement. The comparative cost of brick houses and frame houses will always be a bone of contention between the two industries until those industries join in an investigation, through some neutral agency, and give the building public the facts. Mr. Cartwright ignored in his answer the only investigation of this kind that ever has been made in the country, as far as I know, and with which he is familiar. Such an investigation was made in Denver, Colorado, in 1926-7. The result obtained there was removed from controversy because it was endorsed by the lumbermen and by the cement interests, as well as by the brick interests.

According to recent figures of the Department of Labor, the average cost of single dwellings in the United States in the year 1926 was less than $4800. The house built in Denver at a cost of approximately $6500 in frame, was above the average cost of single dwellings throughout the country. The survey was conducted by the Architects Small House Service Bureau of the American Institute of Architects.

This Can't Be Denied

Co-operating in this survey were the local representatives of the Denver Retail Lumbermen's Association, The Portland Cement Association, and the Colorado Clay Products Association.

The bids upon which the Bureau made its findings showed, for the various types of walls enumerated, to be erected upon an 8-inch concrete foundation to the height of the joists, these cost figures:

Frame, drop siding wall	$1107
Frame, lap siding wall	1112
Frame, stuccoed	1124

Face brick wall	1224
Hollow tile, stuccoed	1232
Common brick stuccoed	1316
Cinder tile, stuccoed	1329

Now here is the answer to this question of comparative costs.

While no bid was taken upon a plain common brick wall, the cost of adding the stucco to such a wall in this case was $222. Deduct that $222 from the stuccoed common brick all cost of $1,316 and common brick was only $1,094, the cheapest of them all. Even the wall of face brick, at $25 a thousand, cost only $117 more than the cheapest frame construction wall.

In order to show a difference of $1500 between brick and frame in an average sized house, the lumber engineer had to charge against the brick house a number of items that are really astonishing. He charges for an extra thickness of foundation wall, which is not necessary. The 12-inch wall is recommended for all foundations and is worth its difference in cost over the 8-inch foundation wall, but if the 8-inch wall is acceptable for the frame house it is just as acceptable for the brick house, because the imposed load does not even approach its bearing capacity.

Absurd Calculations

He charges for the additional excavation for the wider foundation. He even charges for 1½ feet of extra land at the front foot value of the lot against the cost of the brick house. He makes an extra charge for the millwork, the doors and window frames, because in order to substantiate his absurd estimate of the difference in cost he specifies specially made frames for the brick house and stock frames for the frame house, although he must know that stock frames are available for the brick house as well as for the frame. He charges an additional cost for installing the millwork in the brick house, whereas the facts are that it takes less time to set the window frames in an opening made by the bricklayers than it does to cut away material and fit the frames in a timber house.

In figuring the cost of the walls themselves Mr. Cartwright has taken a 12-inch wall from the cellar bottom to the roof, furred, lathed and plastered on the inside. *This is in spite of the fact that the National Building Code Committee, of which he was the secretary, approves and recommends the 8-inch wall above foundation for two and a half story residences;* in spite of the fact that the 8-inch wall is acceptable for two and one-half story residences to the National Board of Fire Underwriters and that this construction is admissible under the building codes of a great majority of important cities in the United States.

Dr. Whittemore of the Bureau of Standards answers the question in the quotation above as to the reliability of the thinner walls. Mr. Cartwright shows his inconsistency in using the 12-inch fured walls for his cost comparison, when in another part of his analysis he uses the 8-inch wall plastered directly on the brickwork in a comparison of heat transmission.

Get Mason Builder

While carpenter builders will be found throughout the country who will put an exaggerated estimate on the cost of brickwork, there is in practically every community one or more mason builders or brick home builders who will produce any reasonably well designed plan in brick for a cost never more than from 3 per cent to 6 per cent over the cost of the same house in frame.

Mr. Cartwright in one place in his analysis admits, in drawing a comparison on depreciation, that "the only difference between the brick and the lumber built dwelling is the exterior wall. The rest of the building is the same. The interior construction, the heating, plumbing, wiring and fixtures make up from 80 to 90 per cent of the cost of the structure, leaving only 10 to 20 per cent in which a difference of structural depreciation may be experienced."

Taking the Department of Labor's survey as the basis, the average sized single dwelling would cost a little less than $4800. Taking the highest percentage mentioned by Mr. Cartwright, being 20 per cent of the total for the exterior walls, the total cost of such walls would be $960.00. In order to substantiate his difference of $1500 in "the average sized dwelling," the carpenter contractor would have to build the exterior lumber walls free and pay back to the owner $540.00 in cash for the privilege of having converted the house to frame.

Question No. 9. "Does a lumber built home cost more in the long run than a similar dwelling built of brick?"

Ans. "No. The extra cost of a common brick house over one of lumber increases with the period of ownership."

Mr. Cartwright's foolish statement that the maintenance of a brick house over ten years is higher than the maintenance of a frame house exclusive of painting is enough to condemn his entire analysis with any thinking person. To begin with, it is based upon his false estimate of original costs, which was disproven by the impartial Denver Survey.

Question No. 10. "How do the monthly carrying charges on a brick dwelling compare with those of a lumber built home?"

Ans. "They amount to approximately fourteen per cent more per month on the brick dwelling."

This deals with the same problem and needs no further answer.

Question No. 11. "Does it cost more to heat a brick-walled dwelling?"

Ans. "Yes. The average well-built brick house requires an additional 1⅕ tons of coal to maintain comfort during the heating season. If it has only 8-inch walls, the cost of heating is much increased.

The lumber engineer states as a fact and attempts to prove that it costs more to heat a brick wall dwelling. Probably one of the most powerful influences for the increased use of brick in dwelling house construction results from the sad experience of persons who have tried to keep themselves comfortable in a frame house as ordinarily constructed.

In his later literature Cartwright openly admits that the frame house requires a larger heating plant and greater consumption of fuel to maintain comfortable temperature inside. In short he admits that his own statement in the Lumber analysis is false. Get a copy of the CBMA pamphlet, "The Cost of Comfort", which proves by the lumbermen's own survey, that the brick house is the easiest to heat in cold weather.

It is the poorly constructed frame wall that has condemned the wooden house with thousands of home owners.

It is admitted by all authorities that the greatest leakage from a dwelling is through the roof. There is no more sense in insulating the brick walls of a house with a roof uninsulated, and having the usual leakage around openings, than to put six locks on the front door and none on the back door, to keep out thieves. Unless windows, doors, roof and floors are made absolutely proof against leakage, the insulating of the brick walls will not perceptibly affect the heating of the house. The reason the frame wall needs insulating is because it is made up of thousands of pieces of wood, with thousands of joints to open by shrinkage or by loosened nails.

The data on heat transmission is thus far based on formulas, and tests of small laboratory samples, not completed practical walls. The best authority available, however, is the Guide of the American Society of Heating and Ventilating Engineers. In parallel columns we quote figures from the Lumber Analysis and the actual figures from the Heating and Ventilating Engineers' Guide of 1928.

		Lumber Analysis	H. & V. E. Guide, 1928
General conditions		Not Stated	15-Mi. Wind
1. Frame construction: wood lath and plaster, wood studs, sheathing, building paper, and siding		0.24	0.227
2. Same: with shingles instead of siding		....	0.228
3. Brick wall: plastered on masonry, 1 side only	8″	0.38	0.332
	12″	0.29	0.263
4. Brick wall: furring, wood lath and plaster	8″	0.27	0.209
	12″	0.23	0.179

Brick Walls Are Warmest

Thus, according to the best authority in America, we find that the frame wall transmits 8.6 per cent more heat than the 8-inch furred brick wall, and 27 per cent more than the 12-inch furred walls so highly recommended by Mr. Cartwright for cost comparison purposes.

Question No. 12. "Are there less fires in brick-walled dwellings?"

Ans. "Statistics of the National Board of Fire Underwriters show that fires occur with 56 per cent greater frequency in masonry-walled buildings than in frame."

Here is Cartwright's masterpiece. He asks a question about fires in brick-walled DWELLINGS. He doesn't answer the question, but gives absolutely irrelevant information about fires in BUILDINGS, other than dwellings.

The lumber engineer went to the National Board of Fire Underwriters for his information. Then he must know that that authority has spoken on this subject in language that can't be distorted or misinterpreted.

Cartwright reminds me of Moran & Mack's famous dialogue:

"We got rid of all the white horses 'cause we found they ate more than the black horses. We tried every way to figure out the cause of it and we couldn't think of any reason unless it was that we had more white horses."

Only Cartwright is not trying to be funny. He is trying to fool somebody.

Let the National Board of Fire Underwriters answer the question as to the fire hazard in frame and brick dwellings, and the relative safety of the two types.

On page 7 of the National Board of Fire Underwriters' "Code of Suggestions for Construction and Fire Protection of Dwelling Houses," we find the following:

"Municipal Building Codes place little restriction upon the construction of dwellings. Within the fire limits, which commonly comprise a small congested portion of a city's area, frame dwellings are usually excluded; wooden shingle roofs prohibited."

In this same book is a table giving the average fire loss per year on dwellings and contents for the years

1915 to 1918, both inclusive. The statistics were "furnished by the Actuarial Bureau of the National Board of Fire Underwriters and compiled from true loss values upon the properties involved." The term "dwelling" includes tenements and apartments except those which have a portion of the building devoted to commercial purposes. The term "brick" includes all buildings having masonry walls and wooden interior construction. The term "frame" includes with wooden buildings, buildings with wooden frames covered with stucco, brick veneer or metal.

Greater Loss in Frame

The table shows that *for each year* the average loss for frame dwellings was $50,880,000, and for brick dwellings $4,815,000; the average loss for frame, therefore, being over 1000 per cent greater than for brick dwellings.

This authoritative data completely destroys Cartwright's trick statement regarding the relative hazards of brick and frame dwellings. Moreover, the following paragraph, found on page 18 of the Underwriters' report, shows that the fire-safe dwelling is well within the reach of every home builder and emphatically contradicts the lumber analysis of comparative cost between brick and frame dwellings:

"There is a prevailing belief that incombustible dwellings are impracticable because of excessive cost; as a matter of fact, this opinion is not justified, for numerous dwellings of this class are being erected in different parts of the country at costs not exceeding 10 to 15 per cent over that of first class combustible construction. Reputable contractors claim that in some localities the difference in cost is less than this. If properly designed, such buildings not only furnish complete safety to the occupants, but reduce to a minimum the danger of a complete burnout from an interior fire, and greatly lessen the hazard of ignition from burning of neighboring buildings. They are also rat and mouse proof as well as having increased sanitary advantages."

Question No. 13. "Is brick masonry as strong as lumber for load bearing purposes?"

Ans. "Every square inch of lumber of the lowest structural grade defined by the Department of Commerce is more than three times as strong as good brick masonry."

Here again Cartwright tries to deceive by confusing *wall strength* with *allowed loading*. Cartwright's statement in the answer is not true. But that is beside the point. The C. B. M. A. has never questioned the strength of timber. A house is built of so-called 2x4s spaced 16 inches apart. This makes a hollow wall, which Mr. Cartwright condemns in brick masonry.

Brick Walls Amply Strong

There is no record of failure of a brick wall resulting from excessive loading in actual construction.

Question No. 14. "Do brick-walled buildings resist tornado and storm effects as well as those framed with lumber?"

Ans. "No. Unbiased reports on recent storms point out the superiority of lumber."

Question No. 15. "Is brick-walled or lumber construction more resistant to earthquakes?"

Ans. "Well-built lumber structures showed little structural damage in the Santa Barbara earthquake as contrasted with masonry failures."

No. 14 and No. 15 should be treated together. In every tornado, cyclone and earthquake nearly all kinds of construction fail, and usually all kinds have examples that do not fail. In the Florida storm of September, 1926, solid brick construction was the one type that had no failure whatever, and there were many brick buildings in Miami. In the terrible cyclone that wrecked the city of Lorain, Ohio, in 1924, a lightly constructed bandstand, old and rotted, stood uninjured in a park surrounded by sound elm trees 6 inches to 18 inches in diameter, that were twisted in two. This doesn't prove that a dilapidated band stand is more resistant to tornado than a sound elm tree. The storms and earthquakes prove only one thing—all good construction of good design resists ordinary wind or earthquake stresses. Poor design or poor construction in any material, frame, brick, concrete, steel or stone, will fail. The same force that will sweep a brick house clean from its lot, as happened in Lorain, would have swept a frame house in the same manner. If a frame house stood uninjured on any given lot, it is certain that a brick house would also have stood uninjured in that same position.

Question No. 16. "Is brick construction more subject to moisture penetration than lumber?"

Ans. "Yes. Practically everywhere in the United States it is considered necessary to 'furr out' plaster from brick walls to prevent unsanitary conditions and damage to interior finish."

Let us answer this question from the brick viewpoint with logic such as the lumber analyst used.

"Is lumber construction more subject to moisture penetration that brick?"

"Yes, practically everywhere in the United States it is considered necessary to nail the sheathing boards together to prevent their falling off."

Why leave part of the masonry wall off any more than leave the nails out of the lumber wall? We recommend always furring of dwelling walls of masonry. It is a part of the masonry wall. And masonry walls when furred are dry walls forever. The joints do not open. They don't shrink or warp. They are not held together with nails that may pull out. They don't have to be painted to keep them tight. They never rot or decay.

Checking Worst Misstatements

This exposes the tricks and misrepresentation of the 16 lumber questions. In the elaborated answers to the ten questions constituting the extended analysis, Mr. Cartwright makes many statements that are subject to attack. The most flagrant of them only will be covered.

On page 3 of the Survey, Cartwright tries to depreciate the claims of good appearance of common brick houses.

Common brick has been promoted on its own merits. The fact that it is used by many of the leading architects of the country in their finest jobs is evidence that common brick does not borrow its glory from any other material. In the last architectural competition of House Beautiful, of the fifty best houses submitted, 12 were of common brick, one part common brick, 16 stucco, 7 frame, 6 shingle, and 7 stone.

Cartwright tries to have it appear that "salmon brick" and "brick containing lumps of unhydrated lime common in certain parts" may injure the quality of the wall. The same might be said of rotted wood, which like salmon brick, is not sold for use where higher grade materials should be used.

On page 10 of the survey are given tables of costs of 2000 sq. ft. of brick and frame wall. The brick wall is 12 inches in thickness, and Cartwright says on page 8, "The quantities of materials and number of hours labor time for the masonry in the brick-walled dwelling are taken from the literature of the C. B. M. A. *and presumably represent a most favorable estimate on their part.*"

His intimation that our tables are dishonest is answered by the fact that the tables were made for the Association by the engineering department of a well known college.

The only literature of this Association bearing these quantity tables is "Brick—How to Build and Estimate." Mr. Cartwright has not taken his masonry quantities from these tables. He uses 2,100 brick for 100 feet of wall, while the largest quantity in any type of bond (common) is 1926. But he is not figuring on common bond because the bricklayer's time for 100 sq. ft. of wall according to our table is 13 hours, while Cartwright charges 17.8 hours. For the helper he charges 15.5 hours, and our table shows 14 hours. Even the Flemish bond, which is the most expensive type of wall in the matter of labor, requires only 16 hours time for 100 sq. ft.

An Authority on Depreciation

In 1926 Mr. Cartwright furnished a story on depreciation to the National Real Estate Journal (October 15th issue). It's assumed he was not employed by the lumber industry at that time for he used figures in that article that do not corerspond with his present analysis. For instance he quotes in 1926, Cecil C. Evers, author of the "Commercial Problem in Building," in the table of depreciation and lifetime of different types of structures on next page.

These are quite at variance with authorities quoted by Mr. Cartwright in 1928 for the lumbermen.

The answer to Mr. Cartwright's attempt to depreciate the artistic value of painted brickwork may be found in any issue of Arts and Decorations, Country Life, House & Garden, House Beautiful, and other high class magazines on home building. There are illustrated usually in these magazines more examples of painted common brickwork than any other single type. Because of its great popularity these illustrations contradict the statement of Cartwright's that homes cost-

Table of Depreciation and Lifetime of Different Types of Structures

	Structural		Commercial	
Class of Building	Life in Years	Per Cent Average Annual Depreciation	Life in Years	Per Cent Average Annual Depreciation
Cheap detached frame residences	30-40	2.90	25	4.00
Good detached frame residences	40-60	2.10	35	2.90
Ordinary brick residences......	50-75	1.65	40	2.50
Good brick and stone residences.	100-150	.83	45	2.27
Frame tenements	25-35	3.50	27½	3.10
Brick tenements and flats......	40-50	2.25	35	2.90
Good class apartment houses...	50-75	1.66	45	2.20
High class fireproof apartment houses	75-100	1.16	45	2.20
Cheap brick shops and dwellings	40-50	2.25	40	2.50
Ordinary brick shops and dwellings	50-75	1.66	45	2.20
Good brick and stone stores and offices	75-100	1.15	45	2.20
High class offices and stores of brick, stone, terra cotta and iron or steel construction....	150	.83	50	2.00

ing $40,000 or up are "very seldom built of common brick." Many of the finest residences on Long Island, in the suburbs of Chicago, Detroit, Cleveland, Pittsburgh, Los Angeles, throughout New England and the South are of common brick.

There are so many other false statements in the analysis that it would require too much space to contradict all. Here are a few examples:

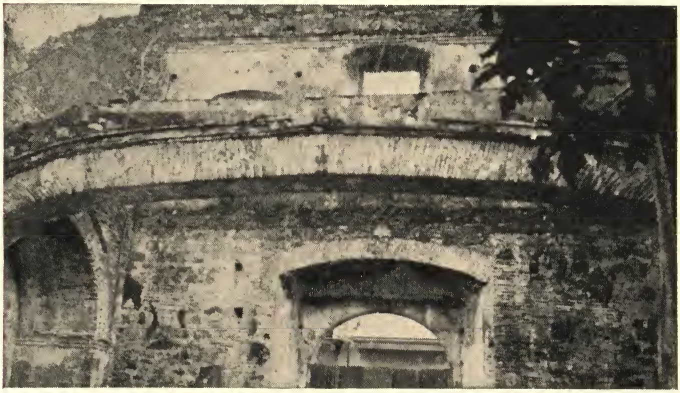
"Again because it has no strength in tension, the brick wall affords no resistance to the pressure which tends to bend the walls of a building inward or outward."

"There are almost no brick buildings in Florida."

"But the cost is much increased." (Referring to skintled brickwork which costs less to lay than any other type of bond.)

"Its ultimate durability is doubtful and uncertain." (Referring to overburned brick on page 3 of survey.)

"Nothing is known of the durability of overburned, fissured brick, etc." (On page 4 of survey.)



An unusual example of brickwork, a flat arch 35 feet long in an old church at Panama City.

Books to Help Sales

"Building Economy"—The C. B. M. A. magazine.

A 9″x12″ monthly, 24 pages, with a present circulation of nearly 20,000 copies per issue.

This magazine has gained for itself an enviable place in the construction field. It has been accorded a cordial reception in the offices of architects, engineers, building officials, contractors, and many others active or interested in the building industry. Each number contains a wealth of interesting material, well illustrated and especially well edited. It covers a variety of topics and is known to effectively accomplish its purpose, which is to create a desire for substantial brick construction. For this purpose it employs both the direct and indirect methods and the latter is sometimes as effective, or more so, than the former.

This magazine is perhaps the most effective piece of literature of this Association and should be distributed gratis by secretaries and members to all those who they believe would be influenced by reading it.

Price: 10c per copy; $1.00 per year in advance.

"Homes of Lasting Charm"

A plan book of 120 small brick homes and four garages, photo illustration and block plans of each, with ten pages of introduction which epitomizes the advantages of brick homes and of brick in garden walls and walks. Complete working drawings of each house and garage are for sale at nominal cost.

This is our main piece for converting the prospective home builder to build with brick. Much of our national advertising is aimed at securing legitimate requests for this book. Members would profit by sending this book gratis to good prospects.

Price: 25c each; 20c each to members in quantity.

"Spanish Homes"

A plan book of beautiful brick homes, with the full assurance that each one has been found satisfactory to those who have built from them. Distinctive California types, in Mission, Spanish and Mediterranean. Whitewashed brickwork.

Complete plans and specifications for any of the houses in this book are available at prices shown under each home.

Price: 25c per copy or in quantity. Same price to non-members.

"Beautiful Homes"—All One-Story and Bungalow Types

Complete plans and specifications for any of the plans in this book are available at prices shown under each home. Every plan in this book calls for a basement, but if you wish to build without one, we will, without additional cost, furnish plans without a basement. Plans furnished without a basement provide for a closet or a screen porch in the space occupied by the basement stairs.

Price: 20c per copy or in quantity. 25c each to non-members.

"Brick Engineering"—Physical Properties of Brick and Brickwork

This is Volume I of a series of books on the subject of Brick Engineering, written by Major L. B. Lent, Chief Engineer of the Common Brick Manufacturers' Association of America.

The second Volume, now in preparation, will deal with the use of brick in sub-grade construction.

Price: $1.00 per copy in leather. 20c each in paper cover. Price $1.25 and 50c respectively to non-members.

"Mud—Its Romantic Story"

It is to satisfy many requests that this little book is printed. Students seeking material for a thesis on brick; writers dealing with architectural or construction subjects; lecturers, radio speakers or luncheon meeting orators who want a background for a talk on brick, or in fact, a complete story ready-made; Brickmen desiring an original and attractive piece of literature for special distribution, all will find "Mud, Its Romantic Story, just what they want. It's not copyrighted and can be used in any way you desire.

Price: $12.00 per hundred. $15.00 to non-members.

"Brick—How to Build and Estimate"

A combined textbook and sales-promoting book. Tells how to properly construct brickwork—ordinary walls and Ideal hollow and Economy walls—and how to estimate material quantities. Points out the advantages of various types of construction. Ninety-six pages of text, tables and cuts.

This book is a standard textbook in many colleges and vocational schools. It contains a fund of authoritative information useful to the bricklayer and to anyone having to do with brickwork. Much prized by architects, engineers and building officials. Should be widely distributed for it builds confidence in common brick.

Price: 25c per copy. Same price to members or in quantity.

"Farm Homes of Brick"

A small plan book containing 12 designs particularly suited to the farmers' needs. Working drawings available at nominal cost.

This book was prepared under the direction of the Agricultural Department of Ohio State University by experts. It has been very popular and helpful in promoting brick homes on the farm, a potential market of great magnitude.

Price: 5c each; $4.50 per hundred to members.

"Farm Buildings of Brick"

Plans of farm buildings prepared under supervision of the Agricultural Department of Ohio State University. Designs of such farm structures as dairy barns, general purpose barns, creameries, chicken houses, farm shops, milk houses, etc. Working drawings available for every design.

The potential market for brick in farm structures over the United States is perhaps as large as our total present production. It is no more difficult to do simple brickwork than to produce satisfactory concrete work. The farm market is worthy of intensive cultivation.

Price: 5c each; $4.50 per hundred to members.

"Brick Silos and How to Build Them"

A complete detailed description of the advantages and of the construction of these important structures, built of a single withe of reinforced common brick masonry.

Such structures are inexpensive and superior to any other known type. The potential market for these is also very great and should be well worth cultivating.

Price: 10c each; $7.50 per hundred to members.

"Storage Structures of Reinforced Brickwork"

A companion piece to "Brick Silos and How to Build Them."

Describes the use of this form of construction for the storage of all such materials as coal, sand, gravel, and other kinds of materials. This type of construction is economical and thoroughly satisfactory, as proven by numerous such structures in use for several years past. This field has been intensively cultivated by the concrete and tile interests and is well worth the brick man's attention; for such bins are often built in batteries and require thousands of brick.

Price: 5c each; $4.50 per hundred to members.

"Skintled Brickwork"

Beautifully illustrated book, of standard size for architectural filing, showing the finished appearance and the methods of constructing seven different types of skintled wall surfaces.

The modern trend away from the conventional and cold wall surfaces has created a large demand for this book, especially by architects. It should be in the file of every architectural office, and could well be used by any salesman who is endeavoring to make a favorable contact with architects. It is equally useful to prospective home builders.

Price: 15c each; $12.50 per hundred to members.

"Practical Bricklaying"

A textbook for the apprentice, journeyman bricklayer, and for any others seeking information in this art. Published by the McGraw-Hill Book Company and sold by them and by us at $1.75.

Price: $1.49 each to members.

"The Heart of the Home"

A beautifully illustrated description of how to properly build a brick fireplace and chimney with illustrations of a variety of fireplace designs.

This book is an appealing piece of literature which should not only attract the attention of prospective home builders and of those who may be adding a fireplace to a home already built, but should also be a welcome piece of literature in the office of any architect. It could also be usefully employed to gain the friendship and gratitude of any architectural office.

Price: 25c each; $20.00 per hundred to members.

"Specifications and General Schedule"

This book is usually sent with each set of working drawings purchased from this office. It contains complete specifications for all brickwork and outline specifications for all other parts of the home.

Price: 25c each.

"The Greatest Thing in the Brick Business"

This small, attractively printed and bound volume is primarily designed to describe the organization, operation, and accomplishments of the Common Brick Manufacturers' Association of America and for distribution to our members and to prospective members. It should, however, prove useful in selling the prestige and standing of this Association to bankers, building loan officials.

Circulars

"Brickwork Textures"

A reprint from the July, 1927, issue of "Architecture;" 9″x12″.

A beautifully illustrated series of brickwork textures on sepia paper, showing a large number of beautiful examples of brickwork design and texture done by some of the country's most noted architects. Another piece which would be welcomed by architects and which can be used to cultivate their friendship.

Price: 12c per copy. 8c to members.

"A Beautiful Brick Home"

An eight-page circular or envelope stuffer, 3⅜″x6⅛″. A concise argument why the home should be of brick and why it is beautiful if so built.

This little booklet is a convincing argument for brick home construction. It, like many other small pieces, can be profitably used as an envelope stuffer or for general direct mail use.

Price: $18.00 per thousand. $12.00 to members.

"The Economy of Brick Basements"

A four-page circular 3½"x6¼".

Gives the reason why brick basements are superior and economical. A concise argument why this part of the structure should be built of brick, as it usually was in the past. Well-suited as an envelope stuffer or for direct mail circulation.

Price: $10.00 per thousand. $6.50 to members.

"Don't Build Until"

Six-page folder 3½"x6".

Briefly sets forth the advantages of hollow Ideal walls as economical construction.

Price: $12.00 per thousand. $8.00 to members.

"The Economy Wall"

Six-page folder 3½"x6¼".

Briefly describes the advantages of the economy wall with three illustrations showing how this wall is constructed.

Price: $15.00 per thousand. $10.00 to members.

"Hollow Walls of Brick"

A booklet of twenty-four pages, 8½"x11".

A complete description of how to build the various types of hollow walls and their advantages. Completely meets the demand for information regarding this kind of brick masonry construction. Should also be effective in converting a prospect to brick construction instead of using hollow units.

This material included in Brick—How to Build and Estimate.

Price: 10c each; $5.00 per hundred to members; $7.50 per hundred to non-members.

"The Economy Wall"

A sixteen-page booklet, 8½"x11".

A complete description of the methods of constructing this type of wall and of its advantages. Used in the same manner as "Hollow Walls of Brick" and should be equally effective.

This material included in Brick—How to Build and Estimate.

Price: $9.00 per hundred. $6.00 to members.

"Mortar Book"

Eight-page booklet, 8½"x11".

Complete information regarding the composition, mixing, and use of mortar. Useful to those who have no knowledge of bricklaying as well as bricklayers. An authoritative but brief treatise which also gives tables for estimating quantities of mortar needed for brickwork.

Price: $3.50 per hundred. $2.50 to members.

"The Big Question"

A four-page folder, 8½"x11".

The "Big Question" is "What's in the walls?" This folder, which fits a standard No. 10 mailing envelope, epitomizes the arguments for a through and through masonry wall. Has been found to be most effective. Should be freely used as an envelope stuffer or for direct mail.

Price: $30.00 per thousand. $20.00 to members.

The Sewer Books: "Did You Ever See the Inside of a Sewer?" and "Facts Regarding the Superiority of Brick for Sewer, Catch Basin and Manhole Construction."

Two books, 7½"x9", sent gratis until present supply is exhausted.

These books are a wonderful exposition prepared for the Bricklayers' and Stone Masons' Union of Chicago, Ill., and show the real permanency of brick for sewer construction. Well-illustrated, many illustrations showing complete disintegration of other sewer materials.

"Salmon Brick"

Four-page folder, 3½"x6¼".

A brief presentation of how masonry costs may be lowered by the proper and legitimate use of Salmon brick. Also gives other uses for salmon brick and is designed to create a market for this grade, which is oftentimes not so readily moved. May well be used as an envelope stuffer or for direct mail to architects, contractors, etc.

Price: $10.00 per thousand. $6.50 to members.

"A Certificate of Quality"

In the completed home the most vital parts of construction are those out-of-sight features. The C. B. M. A. certification bronze is the X-ray that reveals—always—"what's in the walls." The certification bronze, placed in the wall *during construction* becomes the pledge of honest materials after the walls are completed, and guarantees that only Burned Clay Materials were used in its construction.

Price: $20.00 per thousand. $30.00 to non-members.

"The Cost of Comfort"

That heat loss through brick walls is less than through lumber walls is admitted in a recent publication of The National Lumber Manufacturers Association, entitled "The Cost of Comfort." This folder is a review of the above article by Major L. B. Lent, Chief Engineer.

Price: $20.00 per thousand. $30.00 to non-members.

"Cost Survey"

A reprint from Building Economy for October, 1927, showing difference in cost between brick and frame construction was very definitely determined in Denver, Colorado, where a cost survey of small house construction was conducted by the Mountain Division office of The Architects' Small House Service Bureau.

Price: $10.00 per thousand. $15.00 to non-members.

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